Railway Age Gazette

Including the Railroad Gazette and The Railway Age

PUBLISHED EVERY FRIDAY, AND DAILY EIGHT TIMES IN JUNE, BY THE RAILROAD GAZETTE (INC.), 83 FULTON ST., NEW YORK.

CHICAGO: Plymouth Bldg. CLEVELAND: Williamson Bldg.
LONDON: Queen Anne's Chambers, Westminster.

W. H. BOARDMAN, *President.*
E. A. SIMMONS, *Vice-Pres. & Treas.* HENRY LEE, *Secretary.*
The address of the company is the address of the officers.

EDITORS:

W. H. BOARDMAN, *Editor.*
SAMUEL O. DUNN, *Western Edit. Mgr.*
BRADFORD BOARDMAN, *Eastern Edit. Mgr.*
ROY V. WRIGHT
ERNEST MCCULLOUGH
G. L. FOWLER
WILLIAM FORSYTH
S. W. DUNNING
CLARENCE DEMING
B. B. ADAMS
W. E. HOOPER
F. E. LISTER
F. W. KRAEGER
H. H. SIMMONS

Subscriptions, including regular weekly issues and special daily editions published from time to time in New York, or in places other than New York, payable in advance and postage free:

United States and Mexico .....$5.00 a year.
Canada .....$6.00 a year.
Foreign Edition (London)..... ..... £1 12s. ($8.00) a year.
Single Copies .....15 cents each.

Shop Edition and the eight M. M. and M. C. B. Convention Daily issues, United States and Mexico, $1.50; Canada, $2.00; Foreign, $3.00.

Entered at the Post Office at New York, N. Y., as mail matter of the second class.

VOLUME 49. FRIDAY, JULY 15, 1910. NUMBER 3.

CONTENTS

EDITORIAL:

Editorial Notes 109
Hopes and Fears of the New Law..... 110
Growth of the Expense of Preparing and Printing Tariffs..... 111
New Books 112

ILLUSTRATED:

New Tank Car 116
Tests of Self-Cleaning Front Ends; Pennsylvania Railroad..... 124
New Chicago Station of the Chicago & North Western..... 128

MISCELLANEOUS:

Car Distribution 112
The Bill of Lading Controversy 119
Train Accidents in June 121
Electrified Steam Roads and Electric Trunk Lines..... 121
Co-operative Engineering Education..... 122
Annual Meeting of the Freight Claim Association..... 126
Foreign Railway Notes 120, 121

GENERAL NEWS SECTION 133
SUPPLY TRADE SECTION 144

AN engineer is not only a designer and constructor; he must know how to get the highest efficiency from the men working under his direction. As stated concretely by Dean Herman Schneider in an address before the Society for the Promotion of Engineering Education, which appears on another page of this issue: "A working knowledge of the toxins of fatigue is as important, to say the least, as the ability to discover and eliminate the impurities in castings. To conserve the years of labor is as much a part of economical engineering as to find a good preservative coating for bridges. A knowledge of the limitations, the weaknesses and the group subtleties of men is as requisite as a similar knowledge of materials." Judging roughly from the salaries of men who are engaged in "pure engineering," as it is sometimes called, and those who practise the broader engineering as outlined above, the latter are much more valuable than the former. To develop this broader type of engineer should require a very different kind of education or training than is furnished by the time honored methods in use in most of the engineering colleges. It is true that many of the men who possess the qualification for this sort of work will develop themselves, as they have in the past, but the great need of such talent at the present time makes it imperative to adopt improved methods of training in order to develop them more quickly and more thoroughly. It was to fill this need that the co-operative engineering courses were established by Dean Schneider at the University of Cincinnati four years ago. Few men have been subjected to more severe or bitter criticism. It is greatly to the credit of the Cincinnati machine tool builders that they realized the possibilities in the new scheme and backed it up as they did. To-day it stands as an unqualified success; its principles are being adopted by other engineering colleges, and, what promises to give results of even greater and more far-reaching importance, by manufacturing concerns in the training of their apprentices and by department stores and similar concerns for the training and broadening of their employees.

DR. J. N. HURTY, secretary of the Indiana State Board of Health, is credited with having induced the steam and interurban railways of that state to refuse absolutely to carry drunken passengers. The doctor was led to act, it was said, because police officers have been in the habit of loading drunken men on the cars to get rid of them. He intends that this shall no longer be tolerated in Indiana. As the railways in Indiana no doubt have, like those everywhere else, rules forbidding the presence of drunken persons on their cars, it must be assumed that the vital element in this statement is the word "absolutely." That is to say, the doctor has induced the roads to enforce their own rules. If we may judge by the conduct of trainmen in certain states nearer the Atlantic ocean the policemen are not the only men at fault; trainmen, also, are blameworthy for having winked at the policemen's lazy course. And we can readily believe the intimation conveyed with this statement about Dr. Hurty, that it was on the interurban lines that he found the most offensive looseness in policing. Where dignity, decency and propriety prevail on a passenger car that condition is due to a combination of law and tradition, and a disposition to good behavior on the part of nearly all of the passengers, and finally to a good degree of backbone in the conductor and trainmen. In most or all of these elements the interurban car is less strongly fortified than are the cars of the standard railway passenger train. But how is Dr. Hurty going to make permanent this commendable action on the part of the railways? The drunken person has no right whatever on a train; but to repress him rigidly, and consider only those persons who do have rights —the passengers—is not always easy, even for the best disposed conductor or brakeman. To induce trainmen to be vigilant in this unpleasant part of their work, and to stimulate in them an intelligent devotion to their duty of promoting the comfort of the respectable passengers, a premium or prize ought to be offered.

THE "comfort" of passengers includes peace of mind. Too many trainmen seem to think, when a drunken man is aboard, that they have done their duty if they prevent him from directly insulting passengers and from soiling their clothes or coming unpleasantly near. This is a very narrow construction of the rule. The writer recalls an outrage on a sleeping car, at midnight, in which the intoxicated passenger seemed to be in fair control of his faculties and neither filthy in person nor improper in language. He simply sat in his upper berth and yelled; yelled murder, loudly enough to seriously frighten every woman in the car, though all had retired within their berths. And, curiously, the yelling did not sound like that of a drunken man or a lunatic but like that of one nearly or quite sober, and perhaps semi-humorous provided he had been in a forest or on the ocean. The incident is recollected because of the pusillanimous conduct of the porter and the conductor, who ought to have ejected the passenger at the first stop, but who did not do so.

(In this pusillanimity the writer must share, as he did not call the trainmen to account for their neglect). After a half hour the obstreperous passenger subsided. The case is cited here simply to illustrate the difficulty of the trainman's task. To have arrested and punished that passenger would have necessitated at least a day's lay-off for two men, to attend court, involving a 200-mile journey; and the offending passenger, sobered, probably would have wheedled the judge into letting him off with a five-dollar fine. The outraged passengers, having been in their berths, would have objected to being called the next day to testify in court, at great inconvenience. And yet, in spite of the difficulties, the railway or sleeping car employee charged with the care of passengers is bound to do his best, always. One difficulty is that passengers are often too lenient; and so is the trainmaster, who sympathizes with the conductor or brakeman in his thankless task. It would be a good thing to have inspectors (to voice the just complaints of the passenger who is not agressive enough to demand his right), who should be strangers to the trainmen, and so not unduly tender-hearted toward them. In this matter, as in surprise checking of enginemen, there will be those who will declare that inspection by strangers is unjust; but those who reflect and who have had experience with the refinements of discipline do not espouse that idea. A stranger is not necessarily unfriendly; he must, however, be cold. Railway men who have made themselves conspicuously proficient in their work have done so by being cold—in the correction of their own faults.

IT has been said, with truth, that during a considerable number of years past the railway companies have been able to offset measurably the increased cost of supplies and higher wages by increased physical and mechanical efficiencies. New economies have been running side by side with new costs. But they have not run in parallel lines, whether we take separate periods or separate railways, for at one particular period the two currents may diverge widely, just as at any period the railway which has not adopted mechanical economies recedes in the race from the railway which has done so—indeed is not in the race at all. But in studying this great economic competition of railway resourcefulness versus higher costs, one vital point must not be overlooked. In the railway improvements that make for larger efficiency there are natural and fairly distinct bounds. The train load cannot be stretched beyond a certain point now approached on some lines. The new and strong bridge of modern pattern will stand for years without any change that adds to operating efficiency. The reduction of grade reaches its limit when the track becomes level and the curve when it becomes a straight line. Thus the railway labors had a physical limitation in well-nigh every direction. But how about the rival in the race? Will the seller of railway supplies, whether an individual or a corporation, ever fail to get the highest price he can? Will organized labor, resting on the desires of its individual units, ever cease its demands? On the one hand we have an economic force which cannot go beyond natural bounds—and they are probably not far away—and on the other a boundless, nay almost eternal force, based on the enduring law in human nature of get-what-you-can. A material limitation is up against unlimited and very human psychology. What the railways are asking for now in their higher rates is at bottom, a share in that flexible and elastic rule that profits the seller and the wage-earner—in other words, the right to apply to their single commodity, transportation, the principle of varying price which the manufacturer now applies to many railway commodities and the wage-earner applies to his service. It is true that the railways will never be able to drive that principle to the point now attained by the manufacturer—unless an illegal trust—and by the wage-earner, for the railway and its rates are in an age of public "regulation," while most manufacturers and all wage-earners are not. But that fact should not dim a situation in which limited physical economies wage now a losing fight against higher prices and larger pay with the same situation beginning to be further expressed in higher capitalization and decreased *net* earnings.

HOPES AND FEARS OF THE NEW LAW.

LETTERS received from the presidents of the principal railways of this country, in reply to our inquiry, give some idea of the enormous cost of complying with the requirements of the national and state commissions and other federal and state authorities. They also show apprehension concerning the increased power of control given by the Mann-Elkins act of June 18. Some have the hopeful view that this grant of greater power will have a sobering effect on the authorities.

As to the cost of it, in the past, quotations from some of these letters are interesting:

"I think it is safe to say that fully 50 per cent. of the time of all of the traffic officers of this company has been taken up in the last two or three years because of the extra duties imposed on us by these commissions. It has also been necessary to make wholesale additions to the clerical force in the traffic department."

"In complying with the requirements of the Interstate Commerce Commission, State Commissions and other federal and state authorities, we judge that it takes about 25 per cent. of the time of the administrative forces. There is always a very large amount of statistical work."

"We are spending an undue amount of time in dealing with federal and state regulations with little, if any, results that are of benefit either to the public at large, whom the carriers serve, or the railways themselves."

"Since the passage of the Hepburn Act, we have kept an experienced lawyer, with from two to three other lawyers assisting, for the purpose of attending to our appearances before the commissions. The time of our general solicitor is largely devoted to commission work. The operating and traffic department officers are frequently called off from their work for the same purpose."

"Nearly one-half my time, and certainly one-third of our other officers' time has been devoted to commission work."

"In order to meet the requirements, we are obliged to carry larger forces in the clerical departments and in the line of staff officers."

Perhaps it is idle to attempt to estimate the direct costs to the railways in meeting what may be called government requirements. This has, however, been done in several different ways, and, counting as money the salaries paid to officers in the proportion of time devoted and adding this to cash paid out directly, these estimates rarely come below $20,000,000 a year. Although this is a large sum, 2 or 3 per cent. of the net earnings, there are some good results. There is, however, no question whatever that in the general opinion of railway presidents this money is largely wasted; that is, the hearings, the statistics and investigations demanded are apt to be, in their opinion, unnecessary and unfruitful. We find, however, in this correspondence a notable exception; an officer of one of the most important railways in the country. He writes:

"I want to say to you frankly that one-half of this time spent on the commissions and authorities is in attending to things that our own people ought to have seen to themselves, and the fact that it is necessary for any authority to call attention to delinquencies is not creditable to railway management."

This is from an officer of distinguished ability, whom we all respect, and one who is eager to "first cast the beam out of his own eye."

The withdrawal of a considerable proportion of the time of the higher officers of a railway might naturally be expected to impair efficiency in their regular work. Their routine work must be attended to first, and there is left less time for study and initiative. The following quotations indicate this.

"The legitimate duties of railroad officers are certainly being very much hindered."

"Because of the added duties, it has been impossible for traffic officers to go out and visit the cities and towns along the line, to keep in close touch with the shipping public and the requirements of the different communities; and I regret to say that this work has practically had to be abandoned."

Another officer makes a similar statement and adds, "But I would not like to admit that improvement of the quality of the service is retarded or proper check of the cost of transportation hindered."

With two or three exceptions, there appears in these letters from railway presidents a variously indicated feeling of hopefulness and expectation of fair judgment by the public and better working relations with the commissions, because commissioners are all the while learning more and more about railway business, although, as one president remarks, "the railways are paying for their education." One officer goes so far

as to say, "the results of this muck-raking are worth all of its terrible costs." It is probably true that no other class of people in the country is now so precisely law abiding as the railway officers, and perhaps it is this consciousness that leads to this hopefulness. In a desperate situation, nothing is more hopeful and more helpful than a good conscience. The hopeful feeling is indicated more often in the tone of their letters than in their quotable sentences.

"It would seem to me that under the new law, it will depend largely on the methods of the commission as to whether the time necessary to comply with their requirements will be very much greater than in the past, but this can only be determined by actual experience. I am satisfied that the commission will use every effort to make the burden as light as possible, but I am afraid that it will result in much unnecessary work being required of railway officers."

"Our company does not object to reasonable regulations and neither do we feel that our relations with the various state and federal authorities are onerous or that the time is entirely lost."

The generally feared result of recent legislation is a bad effect on the company credit. The power to withhold judgment on a proposed increase in rates for nearly a year, and the power of refusal, involves the power to reduce and even cut off dividends and the power to increase the cost of getting new capital, or even prevent getting capital to make extensions and do more efficient public service.

There are always some reactionaries, really great men who in the past have guided railway operations and made tariffs unrestrained by law. They studied the needs and the possibilities of the region they served. They cultivated promising infant industries with special rates and special privileges. They were pioneers with imagination, a sense of responsibility and great power. Nominally creatures of the state, they made the state. They were kings; they are no longer kings. The following letter may be regarded as either submissive or humorous, but surely it is straight from the heart.

"I have made up my mind to accept the railway situation as it is and to do and to suffer everything that is necessary for us to do and to suffer in connection with this government interference. But accompanied with this, there is also a high resolve, not to swear, nor to curse, nor to talk, nor to write about it."

GROWTH OF THE EXPENSE OF PREPARING AND PRINTING TARIFFS.

THE rules of the Interstate Commerce Commission are causing a very large increase in the expenses of the railways for preparing, printing and distributing tariffs. The stationery and printing bills of the traffic department of the Wabash have increased, as shown by the following figures: Fiscal year 1908, $58,608; fiscal year 1909, $67,504; first seven months of fiscal year 1910, $60,053. For the first seven months in 1909 this account on the Wabash was $32,535. Thus there was an increase in the first seven months of the fiscal year 1910 of $28,000, or 46.2 per cent., which indicates that the total increase for the 1910 fiscal year will be at least $40,000. The growth in this item of expense on the Wabash is not exceptional. The expenditures of the traffic department of the Burlington for printing and stationery have increased, as shown by the following figures: 1907, $92,937; 1908, $114,731; 1909, $141,861; first nine months of fiscal year 1910, $179,131. Thus the bills of the traffic department of the Burlington for printing and stationery were 93 per cent. greater in nine months of the fiscal year 1910 than for the entire year 1907.

The expense of six of the New York Central lines west of Pittsburgh and Buffalo (the Lake Shore & Michigan Southern, the Michigan Central, the Big Four, the Pittsburgh & Lake Erie, the Lake Erie & Western and the Chicago, Indiana & Southern) in 1905 for the printing of freight tariffs, exclusive of their proportion of the cost of joint agency issues, was $33,603.58; including their proportion of the cost of joint agency issues, it was $47,334.38. In 1908 the expenditures of these roads for the printing of freight tariffs, exclusive of their portion of the cost of joint agency issues, was $141,234.65; including their portion of the cost of joint agency issues, it was $187,949.38, a total increase over 1905 of $140,615, or almost 300 per cent. In 1905 these roads employed 47 clerks in the preparation of tariffs at a total cost of $35,687.90. In 1908 they employed 72 clerks for this same purpose at a total cost of $67,308.30, an increase over 1905 of $31,620.40, or 186 per cent. In 1905 they spent for postage on tariffs $2,337.16, and in 1908, $4,199.25, an increase of $1,862.09, or 80 per cent. The grand total expenses of these roads for the printing and distribution of freight tariffs in 1905 was $35,359.34. In 1909 it was $259,456.93, an increase of $170,097.59, or about 200 per cent. No data regarding the expenses of the New York Central lines in 1909 have been compiled, but they have continued to increase. For example, in 1905 the tariff department of the Big Four had 10 clerks; in 1908, 15; and now it has 30.

A compilation of data similar to the foregoing for all the railways in the United States would show that the aggregate annual increase in the expenses of preparing and distributing tariffs since the revision of the law in June, 1906, amounts to several millions of dollars. The Interstate Commerce Commission has been justified in causing a large part of these additional expenditures. Tariffs were formerly framed, printed and posted in a very unsatisfactory way. But the commission has made and is enforcing some rules which are causing large increases in railway expenses without conferring on the roads, the shippers or the public any proportionate benefits. Some of its rules, which are causing large expense to the railways, are doing no good to anyone.

For example, it requires every tariff containing a rate which applies from a given station to be filed at that station. Now, the tariffs contain many rates applying at small stations on which shipments seldom or never are made. There are numerous small stations from which almost nothing but coal is ever shipped and at which little but occasional consignments of merchandise is received. There are numerous other stations in agricultural districts from which nothing but live stock and grain and an occasional consignment of poultry, eggs and butter are shipped, and at which there are only occasional receipts of merchandise. But as there may at some time or other be shipments of other commodities from such stations, it is necessary for the railway to provide a full line of rates to and from them; and since these rates are provided enormous tariffs containing innumerable rates which are never used are required by the commission to be posted. The only tariffs which are of any use to anyone at such stations are those containing the rates on which commodities are regularly shipped to and from them. If a shipment of any other commodity is to be made, the shipper does not consult the tariffs on file at the local station to find out what the rate is, nor does the agent. Neither would trust himself to wade through the complicated schedules and ascertain the rate. In such a case the agent wires or writes for the rate to the nearest division freight office, and he and the shipper invariably accept and act on the quotation made by the division office. The expenditures for many of the large tariffs filed at small stations and the cases in which they are kept are completely wasted. The money spent on them would just as well be burned.

Again, the commission requires that each road shall every six months print an index of all tariffs in which it is shown as the initial carrier, and that it shall also print a list of all tariffs in which it is a participating carrier. Supplements to these indexes must also be published every month, and no more than two supplements may be effective at the same time. Now, the commission requires each road to keep on file at Washington its concurrences in the tariffs of other roads. By referring to these concurrences the commission can determine controversies as to whether carriers are or are not participants in each other's tariffs. Therefore, the publication by each road of an index of the tariffs in which it is the initial carrier, and also an index of the tariffs in which it participates, involves a complete, unnecessary and wasteful duplication. Surely an index covering outbound issues is all that it would be necessary to file at a local station. The requirement that these in-

dexes shall be republished every six months also seems unnecessarily rigorous. Their republication annually appears to be all that should be reasonably required. Again, the commission prohibits more than one supplement being issued to a one-page tariff. The consequence is that every time the most trifling change has to be made in such a tariff the entire expense of printing it has to be incurred. Such tariffs frequently have to be reprinted every month, and sometimes even oftener.

In reply to complaints, members of the commission assert that the growing cost of publishing tariffs is mainly due to the fact that they were not properly published before the Hepburn act was passed, and that the increase in expenditures has been caused by their necessary initial republication. But the figures we have given show that the increases were not confined to the first or to the second year of the administration of the new law, but are greater this year than in any previous year. Officers of the commission also say that they cannot make their regulations any more liberal without working a practical nullification of the law. The law, however, gives the commission wide latitude. It provides that it may, "in its discretion for good cause shown . . . . modify the requirements . . . . in respect to publishing, posting and filing of tariffs, either in particular instances or by general order applicable to special or peculiar circumstances or conditions." This seems to give it ample authority to make any reasonable rules which will require the roads to so publish, file and post their schedules and classifications as to make clear what are the legal rates and to render it convenient for shippers to ascertain them, and which will at the same time reduce the trouble and expense of tariff publication, etc., to the practical minimum.

The language used by Congress in the act can hardly, it would seem, be reasonably interpreted to mean that when the New York Central gets out a tariff on business originating at points on its line and destined to points on the Burlington, and the Burlington gets out a tariff on business originating on its line and destined to points on the New York Central, each of these roads should be required to index both the tariffs in which it appears as the initial carrier and those in which it appears as a participating carrier. Nor, it would seem, can the language used by Congress be reasonably interpreted to mean that the commission was to require great stacks of tariffs to be printed for filing at points where nobody ever would make use of them whatever. Such requirements make a farce of government regulation. They also make an unnecessary and unreasonable burden of regulation to the railways directly and to shippers indirectly; for railway expenses must be met out of railway earnings; earnings must be obtained by the imposition of charges; and in the long run the public must pay for every unnecessary and unreasonable expense which the carriers incur.

While the commission's tariff rules have caused an enormous increase in railway stationery and printing bills, they have, in many ways, done a great deal of good, and it would seem that, to make them wholly beneficial, the commission could and should make some modification in them which will eliminate their unreasonable requirements without relieving the carriers of any duty that they ought to perform or depriving the shipping public of any facilities of which it makes real use for ascertaining the legal rates.

NEW BOOKS.

The Valve Setter's Guide. By James Kennedy. Angus Sinclair Company, New York. 58 pages; 7 in. x 5½ in.; cloth. Price, 50 cts.

This little book contains a brief but comprehensive treatise on the three most popular forms of valve gear used on American locomotives, and is intended as an aid in the education of young railway machinists and engineers. The Stephenson, the Walschaert and the Baker-Pilliod valve gears are taken up in the order of their introduction. The valve gear of a locomotive is the most intricate part of the reversible steam engine, and this study of valve gear is intended to develop the faculty of giving thoughtful attention to the details of involved mechanisms.

CAR DISTRIBUTION.*

BY N. D. BALLANTINE,

Superintendent of Car Service, Chicago, Rock Island & Pacific.

The question of car distribution is probably a more vital factor in the efficient operation of a railway than it is generally considered by the public, or for that matter, by many railway officers who have not given the matter careful study. Like many other railway matters, it has not been reduced to anything like an exact science; but progress is being made, and will doubtless continue, as the increased cost of labor and material and the stress of competition force a more scientific investigation into the effect the management of this branch of the service has upon general operating efficiency.

At the outset it should be understood that owing to a great variety of differences in local conditions it is not practicable or proper to compare the operating efficiency of one road with another, nor for that matter, one division of a road with another division, unless a very large number of factors are considered and the data carefully compiled upon similar bases—a thing very difficult to do in practice.

The answer to the question, "What is perfect car distribution?" would depend largely on the viewpoint from which a reply is made. From the standpoint of the public, or the individual shipper, it would doubtless mean that immediately upon demand a railway company should furnish the kind of a car ordered, that it should be in good condition with reference to protection of lading from damage, and that it should carry the lading to destination without being subjected to transfer or undue detention en route on account of physical defects or other causes, and this regardless of the difficulties the road has to overcome or the *expense incident thereto.* From a railway standpoint, the answer would be that perfect car distribution would serve the largest practicable number of people in the most satisfactory manner and at a *minimum cost for the service.*

Before intelligent distribution can be made it is, of course, necessary to know what you have to distribute, where it is wanted, for what purpose, where it is to go. If the conditions are such that if the freight is loaded, can it be moved with a reasonable degree of promptness? Then comes the question of how best to serve the largest number with the least expense and delay.

To the layman it might seem an easy matter to determine where the empty cars are, and their condition. But it is not so in practice, particularly on the larger roads, where the bulk of the business is done. I venture the assertion that practically none of the trunk lines' car reports account for over 85 per cent. of the total cars on their line. The majority of them account for much less. But, for the sake of argument, let us assume the reports account for 85 per cent. of the cars. On a road having, say 50,000 cars on its rails, this would be 7,500 cars unreported. This does not mean that all of these unreported cars are available for distribution or use, because many of them are under load, loading or unloading. But there is more likelihood of empty cars being unreported than cars in other service, because loaded cars are usually accompanied by billing which can easily be checked in an office, and the cars loading and unloading on industry or team tracks are more carefully checked than those in other parts of the yards, on account of the demurrage feature in connection therewith that may accrue on them. It is frequently much easier to sit in the yard office and guess at the number and kind of empties on hand than to get accurate information, and it is safer for the yard office to underestimate than to overestimate, for if it were called on to bill the cars on an order it might be embarrassing to explain what became of the equipment. Then, too, some division officers prefer a surplus of equipment to protect their local requirements in order to avoid explaining

*Condensed from a lecture delivered to the students of "Railway Economics," University of Michigan, Ann Arbor, Mich.

why cars are not furnished, regardless of the fact that an adjacent division may in reality be suffering greatly for equipment, on account of the rendering of more correct reports from such other division.

With reports as above cited, it is fair to assume that 30 per cent. of the unreported cars are empty, making 2,250 empty cars which cannot be distributed. Now, an average trunk line having 50,000 cars on its rails will load approximately 5,000 cars per day, and during the busy season its reports will probably show a shortage of 1,000 to 2,000 cars per day. But what would the situation be if its reports were correctly rendered? A surplus of 250 cars.

The next part of the car report is not entirely under the control of the railways. Human nature is very much alike the world over, and when things are scarce there is always an abnormal demand, and this holds true in the case of cars ordered by shippers; they are prone to order more cars than they can load. Orders for 25 to 50 per cent. more equipment than could actually be loaded is not an unusual condition during times of heavy business. From large centers, where there is much competition, it is frequently the case that an order for 100 cars of a given commodity to move is given to four or five roads. If none of the roads could fill the order promptly, the sum of their reports would indicate a shortage of 500 cars to move 100 carloads of business.

Under the conditions cited above, who can say that the railways of the country, as a whole do not own enough equipment? Simply because a shipper is unable to obtain and load all the cars he orders within a given time does not necessarily imply that there is a "car shortage" in the sense that the road serving him has insufficient equipment. As an illustration, a certain road in the southwest during the fall of 1907 (when it was alleged there was the greatest "car shortage" in the history of the road) had, during a given month, an average of 7,800 cars on its line per day. The same road in the same territory in the same month of the year 1909, with 26 per cent. less equipment on its line each day, made 55 per cent. more car miles than it did in 1907. In the face of such facts, would anyone say that the trouble with that road in 1907 was a "car shortage"? What it probably suffered most from was too many cars in proportion to its other facilities, and the probabilities are that if empty cars had been taken from that section, so as to have enabled them to circulate more freely, it would have resulted in enabling a larger volume of tonnage to be moved. As a student of transportation problems, the view I now hold is that the roads of the country, as a whole, have too many cars in proportion to their other facilities for handling them. As the strength of a chain is its weakest link, so also is a road's strength dependent upon adequate terminals, good track, sufficient side tracks, ample motive power, with the accent on the "ample." A deficiency in any one of these factors may cause delays to equipment which will offset any increase in equipment units that may be made.

As neither the shipper nor the railway man knows definitely very far in advance just what the car requirements are going to be—aside from the uncertainty attending the basic commodity, agricultural products, due to the elements—the mill man, the coal operator and the manufacturer on any given road usually have an exaggerated idea as to the output of their respective plants, which is natural, as they would prefer a surplus of equipment to a shortage, particularly as they do not directly feel the effect of interest and insurance on, and depreciation and maintenance of, idle equipment. A moment's thought on the subject, however, must convince one that a surplus of equipment ultimately means a narrower margin between earnings and expenses, and that the best manner in which to level up is by providing a more uniform traffic instead of trying to move a large part of it in three or four months of the year, and during that portion of the year when, on account of weather conditions, the difficulties and cost of operation are the greatest. It would, therefore, seem that the question of increasing equipment should be left to the railway man's judgment, and that in forming such judgment he would need to have a large amount of data accurately compiled so that he could consider at least the questions which follow:

Is the equipment properly proportioned to the motive power?

Is it properly proportioned as to kinds of cars to meet the traffic conditions of this particular road?

Is the physical condition of the road such that it will make practicable reasonably prompt movement of trains?

Are the terminal facilities adequate?

Are passing tracks long enough and sufficiently frequent?

Is the water supply ample and satisfactory?

Is the traffic uniform throughout the year, or is it spasmodic? What are the widest variations from month to month, and are these variations confined to a limited area, or are they general?

During heavy business, what is the prevailing direction of traffic, and what per cent. greater is such business over the light traffic?

What is the density of passenger train miles as compared with that of freight train miles?

Are the facilities ample for keeping motive power and cars in repair?

Is the road one which originates most of its traffic, or is it a receiving or an intermediate road? Numerous considerations are necessary, according to the category into which the road falls.

What is the average haul? As this decreases with a shortening of the distance between producing and consuming centers, it means a larger equipment to handle the business, other factors remaining the same, on account of the increased number of delays incident to loading and unloading.

The kind of car has much to do with the relative efficiency obtained. The tendency should, as far as practicable, be toward equipment which can be universally used instead of toward special classes, as this means less empty mileage, although it may occasionally mean a little more inconvenience to the patrons.

If a long haul is involved, the question of transfer facilities at terminals should be considered; also the commodities, as many patrons will not permit their freight to be transferred and continue giving you the business.

The commodities handled are also a vital factor as to the number of units required, heavy coal-carrying lines requiring more units in proportion than lines carrying large quantities of merchandise, stock, fruit and packing house products, etc.

THE CAR DISTRIBUTOR'S OFFICE.

Let us now consider the every-day working of a well-regulated division office with reference to the car distribution, the duties in connection with which are manifold, and should be executed by high-grade talent. An inexperienced, careless or indifferent man in this position can, by the issuance of one or two improper orders, waste more money than his salary would amount to in a year.

It is the custom of most roads to have a telegraph car report wired to the division offices in the afternoon between 2 and 6 p. m., it being tabulated and classified by the receiving operator on forms provided for the purpose, so as to aid the distributer in readily locating his surplus or shortage of any particular kind or class of equipment. This report should then be cross-footed, balanced, summarized for the division or sub-division, as required, and the totals transmitted to the general office in such details as may be necessary. This report should account for all the cars on the road, regardless of the service or condition they may be in.

In addition to the regular car report, most divisions obtain

a partial car report by wire at 7 a. m., showing the loads and empties on hand for movement, their wants and any special information needed by the distributer.

The afternoon report is used by the distributer in placing orders for the movement of cars during the night and lining them up for the local trains the following morning, while the morning line-up is for the purpose of keeping closer to the movement and having proper disposition made of cars which are ready for movement when locals reach such stations.

In addition to the telegraph car report, a daily mail car report is made by all stations excepting large terminals, showing in detail the car numbers, initials, date of arrival (lined up in accordance with the length of time the car has been at the station, the oldest car being at the top of the blank), the commodities they are loaded with, an analysis of the car's detention at the station; if a foreign car, its home route, and forwarding reference if forwarded during the period covered by the report; the home route information referred to being obtained by a special card which accompanies all foreign cars in their movement over the road, so that in the event the distributer cannot give the car a proper load, it can be disposed of with the minimum amount of empty mileage.

In the case of foreign cars on hand which an agent cannot load in accordance with instructions, a special form is used to give the distributor full information as to its initials, number, home route, etc., so he can order it to some other part of the division in the event that a proper load can there be obtained, or if he cannot utilize the car, he consolidates the wires from various agents into one message and asks the general officer distributing equipment for instructions. The general officer in such case either orders the car to another division for loading, orders it home, or arranges with some other road to accept it and move it home, if by so doing he can save an abnormal empty mileage.

The mail car reports are then checked to see that all are received, that they are properly made out, that the distributor's orders are being carried out, as he can readily ascertain what kind of cars are applied and the commodities loaded. They should be particularly scrutinized to see that the proper kinds of cars are being utilized; for example, stock cars are moving west empty, box cars are moving east empty; a shipper orders a box car to load brick or tile. To furnish a box car under such circumstances means a cross-haul of equipment. In many instances the shipper does not really care what kind of a car he gets, but merely orders a box car because he knows there are lots of them empty going over the road. Another example: Mine props are frequently loaded in box or stock cars which normally are en route to the mines. There are many such instances as these; failure to make proper use of them is what frequently makes car shortage more acute, and increases the cost of conducting transportation. Just how much the increase caused is it is difficult to say, but after eliminating fixed charges, I believe it safe to figure it would cost the average road 2½ to 3 cents per empty car mile. If, then, this factor, or any other that any particular road determines as its average for such service, is used, and the empty car mileage analyzed carefully, I think it will surprise many officials to know what this item on their road amounts to.

The tracing end of the car distributor's work is no small item. As a rule, when business is light, cars mave promptly, and information covering their movement is more quickly available, and the tracing in proportion to the total business handled is much lighter. But in the fall, when business is heavy and weather interferences cause the movement to slow up, the shippers expect the same service and prompt information, resulting in an increased number of tracers in proportion to the business. In tracing a car from the general office full information is usually given regarding it in the message, namely, the initial, number, contents, destination and date into a given station. Now, by referring to the mail car report, which should be filed in a vertical index number, by having the date it moved into such station, it can readily be located if still on hand, or the forwarding information obtained without the necessity of telegraphing the agent. Large terminals keep an index record of all cars, with arrival and forwarding reference, which can be obtained in a moment's time. The files covering transfers are usually kept according to the ending number, using either the vertical system or a series of pigeon holes, separated into 10 or 100 compartments, according to the volume of business being handled.

The diversion of traffic in transit, particularly fruit or perishable commodities, requires a lot of care and attention, as failure to effect a diversion once accepted frequently results in very expensive claims.

Daily advice must be given the general officer distributing the equipment of cars applied on orders.

The handling of each class of car has its own peculiarities. It is necessary to keep further ahead of stock car orders than of orders for most equipment. The distribution of coal cars in a mining territory is an entirely different proposition from distributing box cars for a lumber or grain territory. In the general office all orders are given a number and advices tabulated until the order is filled. A "log" book is kept and notations made currently where unusual conditions occur preventing the carrying out of any particular order of importance.

The detail car reports are tabulated in the telegraph office as received, so that detail comparisons may be quickly made for any particular division. For example, we know in a general way that the interchange of cars between connections and to and from connecting divisions about offset each other; hence, if the reports show a loss or gain of 500 or more cars, we can readily see that there is something wrong with the reports, which may be accounted for by the wires being down and a report being incomplete, or an error made in telegraphing.

Extreme care has to be used in placing a general order affecting several divisions to so word it that it is not susceptible of misunderstanding. While it may appear simple to the one issuing it, it would not be to a new yard clerk. I recall an incident in this connection where, owing to a congestion on a certain section of a road, it was desired to divert some traffic via another gateway, and an order was issued accordingly by the traffic department. A yard clerk took it to apply on empty refrigerators and billed them accordingly. It just cost $833 and 16,500 unnecessary empty car-miles to get the cars back in their proper place.

The checking of an empty cross-haul in the general office is done in a slightly different way than by the local car distributor. The road should be sub-divided according to train terminals, or at shorter intervals, if branch lines radiate between them, and such branches do an appreciable proportion of the total business. The empty car-miles should be computed by classes and direction, keeping all of one direction together; the clerk tabulating the information checking to see that box cars do not move east and west over the same sub-division on approximately the same dates. If he finds such a condition, an inspection of the wheel report indicates whether the car moving opposite to the regular movement was "bad order" and en route to shops; if not, a memorandum is given the chief car distributor, who may know of some reason for such a movement, and if he does not, the division officer's attention is called to it at the time and an explanation made. Continually watching and calling these cases to their attention keeps them on the alert, as it is easier to prevent mistakes by watching the matter currently than to "explain why" later on. At the end of the month the totals are checked and any unusual conditions pointed out and comments requested, the information being sent to all interested officials.

It is important for the officer distributing equipment to know the direction the greatest volume of traffic is moving, and, as far as practicable, to deflect empties in the opposite direction, or take advantage of a short route, either over his own or a foreign line if satisfactory arrangements can be made, so as to keep down expenses. A large amount of money is wasted in making long,

circuitous empty hauls, when by the payment of a cash consideration the cars could be sent via a foreign line to the point required with much less expense and delay. But the least expensive method of handling a car is frequently overlooked. Rather than pay money to some connection who might make money by handling the cars, they are often hauled long journeys and a large amount needlessly expended in "conducting transportation."

The general officer in charge of distribution should also watch the traffic being loaded with reference to the kind of cars, as in many instances the division man would have no way of finding out that the furnishing of a certain class of car in his territory was not best for the road as a whole. For examples, potatoes move a part of the year in refrigerators from the north to the south; at the same time there is a movement of cotton to the northern points. By utilizing the refrigerators for loading the cotton northbound, exceptionally good mileage with a minimum percentage of it empty is obtained. At other seasons, before cotton begins to move, watermelons move from the south to the north, and by using such cars with the ventilators open, the melons reach destination in better shape probably than if loaded in stock cars, where they are subject to being "plugged" by the hoboes.

It frequently happens that lack of repair facilities make it necessary to move bad order cars with the current of traffic to a repair point, and at the same time move empty cars into a terminal to provide for outbound loading. When this occasion arises it is, of course, necessary to select the kind of cars which will decrease this cross-haul to a minimum.

IMPORTANT ECONOMIES.

The question of transferring long-haul business is a very important one, particularly on the trunk lines, it being a very difficult one to handle. A large number of shippers will not permit their business to be routed via a line which makes a practice of transferring. Many make it an invariable rule to file a claim for damages immediately upon ascertaining that a transfer has been effected. There is no question in my mind but what a good part of the shippers' complaint is well founded, due primarily to the railways neglecting to supervise the transferring to see that it is properly done. As a general proposition, however, it would seem that the question of transfer is one in which the shipper should not be interested. When a road signs a bill of lading for a car of freight in good condition it is in duty bound to deliver the freight in the same condition at destination, and the manner in which the transportation is effected is immaterial. As an illustration of what this means to the carriers, an intermediate carrier, say 1,200 miles long, is offered at Chicago a carload of freight in an eastern line car, destined to California. The commodity is such that with reasonable care it could be transferred for, say, $3, and delay the car one day in doing the work. The intermediate carrier has empty refrigerator cars moving to California, to be used in eastbound fruit business; furthermore, it has no eastbound loading for the eastern line car. To make the transfer would save it 2,400 empty car miles, which at a cost of at least 2½ cents per car mile, would mean $60, less the expense for transfer, the per diem while car is being transferred, and any claims that might arise. But on a large number of commodities this saving cannot be effected, for the reason that if a road should transfer the goods it would lose the shipper's business entirely to some other road which would not transfer. Under such conditions, however, it is quite evident that there is an economic waste which should be eliminated.

Another illustration of the economy of transferring is brought to mind. Suppose a large shipment of rails from the east moving in low-side gondolas, destined southwest. On the division where they were received empty stock cars were being sent southwest for stock loading. Owing to extreme heat and labor conditions the cost of transferring was very high, about $6 per car. But this was a nominal cost compared with cost for cross-hauling coal and stock cars to the extent of 1,000 miles.

Inasmuch as a very large percentage of the total traffic moved is company material, the question of actual cost of transporting it, as well as the best time to move it, is a very important matter to be watched by the distributing officer. A knowledge of the essential factors of cost, excluding fixed charges, should, as nearly as possible, be obtained by divisions, separated as between conducting transportation, freight car repairs and per diem, for conditions arise when one or more factors enter into the proposition. As an illustration, lumber is desired for use, say at Kansas City. A purchasing department desiring to make a showing for its own department may solicit bids from Oregon, Louisiana, Arkansas and Texas, and take the lowest bidder. But if to the cost of the lumber is added a transportation charge for the movement to Kansas City, considering the factors as outlined above, it might be that the highest bidder's product would in reality be the cheapest for the road, as it might be hauled over divisions the operating cost of which is very low as compared with that of others, and in addition move opposite to the direction of traffic, utilizing cars which would otherwise move empty, in which latter case the cost of freight car repairs and per diem should not be included.

Then, too, the question of moving and storing at points of consumption railway supplies such as lumber, ties, steel and particularly coal, at a time when commercial tonnage is light, will materially aid in equalizing traffic on the road, and it seems to me would appeal to the coal operator to such an extent that he could afford to sell the railways the coal for enough less to offset the extra cost of handling, interest and depreciation, as it would equalize his production, and it is my understanding that mining is similar to the railway business with respect to decreasing the cost with uniform tonnage.

The above are samples of problems which should be carefully studied and I believe indicate the complexity of the situation in determining efficiency. It is a relatively easy matter to order empty cars from one part of a road to another and thereby obtain a high average mileage per car per day, or a low car rental unit, making a nice showing for the car service department, but it does not always follow that such a showing means the best net results for the road as a whole. The results can only properly be judged in relation to traffic requirements, ratio of empty mileage, facilities at terminals, power situation, bad order conditions, etc.

To summarize, then, an effective car service department's requirements are about as follows:

(1) A carefully worked out system of reports adapted to the needs of the particular road, with sufficient force and authority to see that the system is followed.

(2) Thorough organization, building it upon the basis of having it as flexible as possible, and working toward the end of having full use made of information at hand without having to ask division or local offices for data which have once been furnished, and of handling all matters in the regular channel.

(3) The hearty co-operation of and close working with the traffic, fuel and purchasing departments.

(4) A knowledge of the general conditions of the road, including its physical, mental and spiritual characteristics.

(a) *Physical.*—To avoid issuing absurd or impracticable orders, as the issuance of such tends toward a loss of respect.

(b) *Mental.*—To know to what extent each division may be relied upon to figure ahead on its own wants or take advantage of peculiar local conditions to relieve a situation.

(c) *Spiritual.*—To know where there is the real co-operative spirit, which knowledge assures that orders issued to a division where it exists will be acted upon promptly with an idea of being made effective without their having to be checked up. As the human element is such a potent factor, the friendship or acquaintance of the man on the ground is an invaluable asset.

(5) Eternal vigilance and patience without end, everlasting checking of details.

NEW TANK CAR.

The Chicago Steel Car Co., Harvey, Ill., has designed and built a new tank car which has the same capacity as the standard car, 8,000 gals. The feature in which it differs from other tank cars is in making the portion at the bottom of the tank from the bolster to the end sill flat, allowing the cylindrical portion between the bolsters to drop down to the lower level of the draft sills. This lessens the height of the center of gravity of the loaded car 18 in., and, besides preventing rocking, which is characteristic of the high tank car, the design lends itself to the construction of a strong underframe, especially at the draft sills.

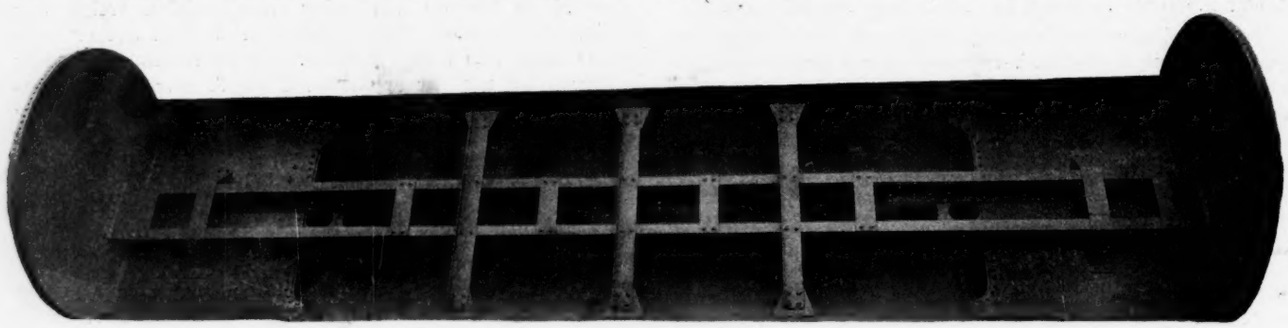


Fig. 1—Interior View of Tank Car, Plan A, with 15-Inch Center Sills.

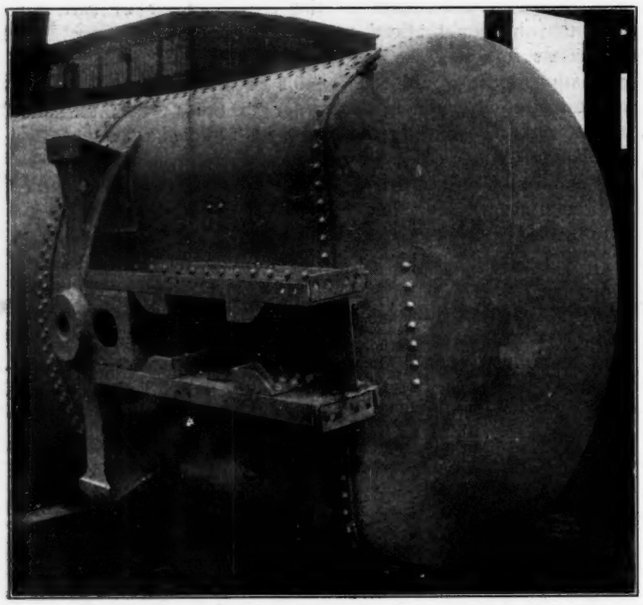


Fig. 2—Draft Sills and Body Bolster of Tank Car.

The tank is 84 in. in diameter; the upper sheets are ¼ in. thick, the heads 5/16 in. and the lower sheet ½ in. The sample car which is illustrated has through center sills of 15 in., 33 lb. channels, the upper flanges of which extend inside the car clear to the heads (Fig. 1), while the lower flanges from the body bolster to the end sill are cut away and replaced by channel draft sills on the outside riveted to the body bolster casting as shown in Fig. 2. These inside channels are braced laterally by three heavy flanged angles 4 in. x 6 in. x 3/8 in., with gusset plates connected to the tank. They also have tie plates 6 in. wide between and beyond these lateral braces. The flat bottom of the tank from the bolster to the end is a sheet ½ in. thick and makes a strong construction for the attachment of the draft sills; the latter abut against the large steel casting, which forms the body bolster and provides a projecting flange for ample rivet area in the attachment of the draft sills. The bolster casting also serves to support the brackets for the running boards. The outer ends of these brackets are attached to 6 in. channels which form the side sills and support the running boards. The car as thus constructed, which may be designated as Plan "A," weighs, with the standard M. C. B. 40-ton arch bar trucks, 34,120 lbs.

Other forms for the central portion of the underframe have been designed for the purpose of reducing the weight of the car, and in Plan "B" (Fig. 3) 8-in. channels, 25.2 lb. per foot, have been substituted for the 15-in. channels.

The third plan, "C" (Fig. 4), eliminates the center sills entirely, and the body bolster casting (Fig. 5) is modified to provide a large flange extending toward the center of the car and having a large riveting area. The flat sheet is extended 30 in. beyond the bolster and is bent down and riveted to the circular portion of the shell, forming a tension member over the bolster and strengthening the bottom sheet. The M. C. B. rules require 50 sq. in. of sectional area in the bottom sheet of tank cars, while the plan here described provides 62½ sq. in. The design of plan "C" is intended to overcome the objections which may be made to the use of structural shapes for sills inside the car, as they have a tendency to accumulate residue which is difficult to clean and may contaminate the higher grade oils. The tendency to shear rivets in a construction of this kind will be materially lessened by the use of friction draft gears, and the Cardwell friction draft gear is used on this car.

In the further development of the steel car underframes de-

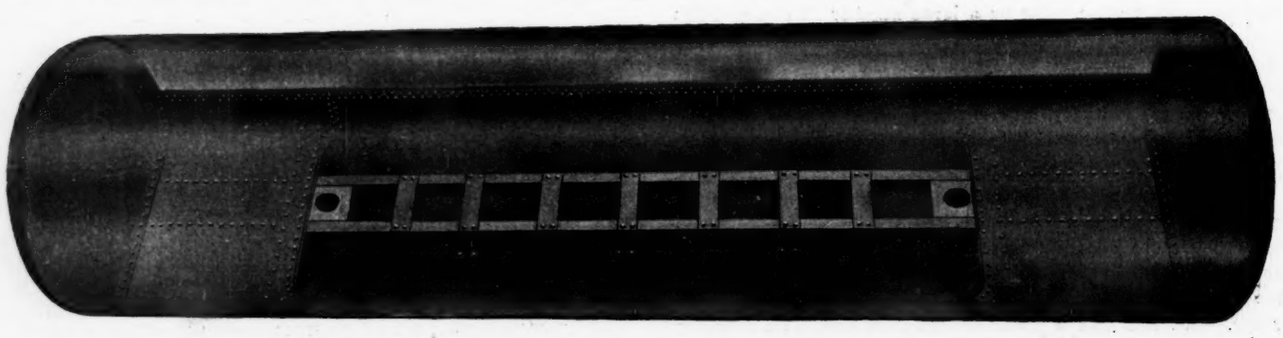


Fig. 3—Interior View of Tank Car, Plan B, with 8-Inch Center Sills.

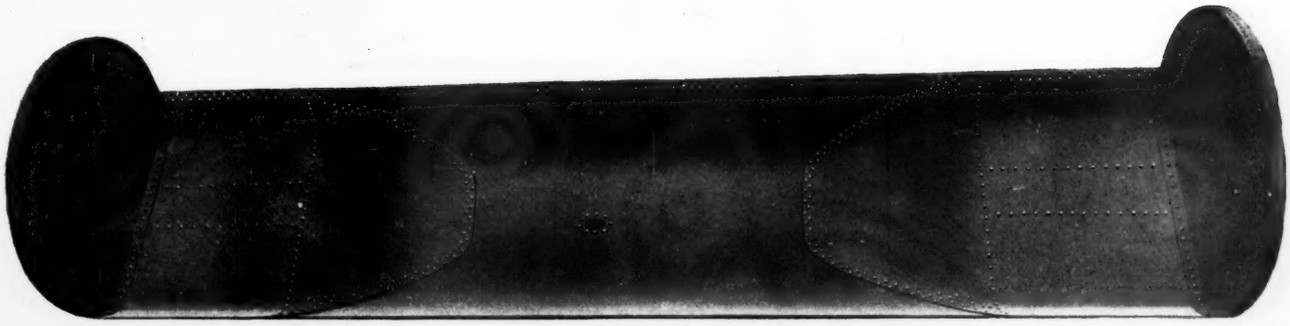
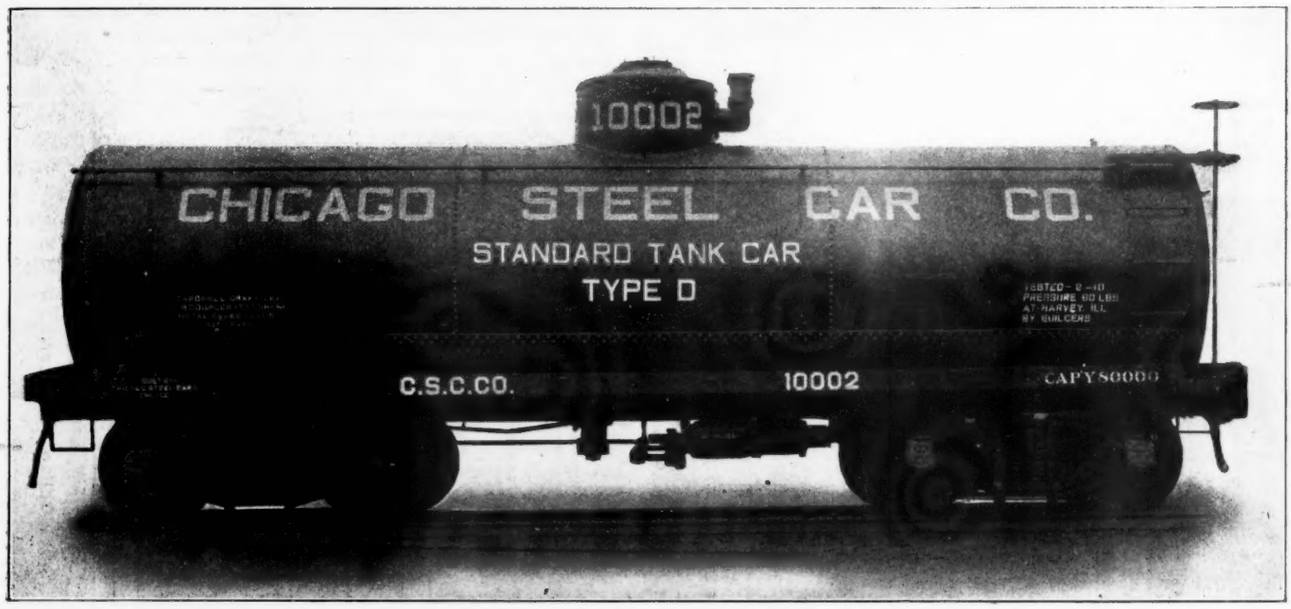


Fig. 4—Interior of Tank Car, Plan C, Without Center Sills.



Steel Tank Car, Chicago Steel Car Company.

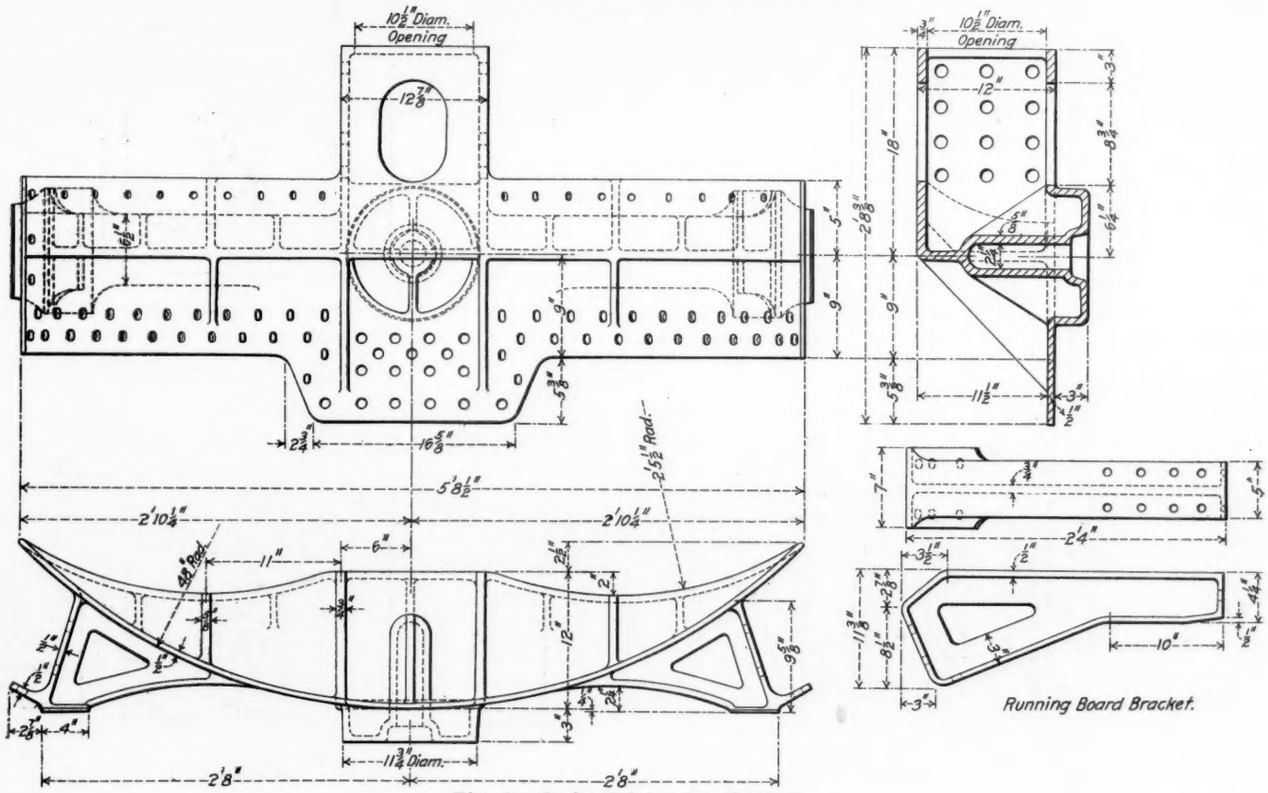
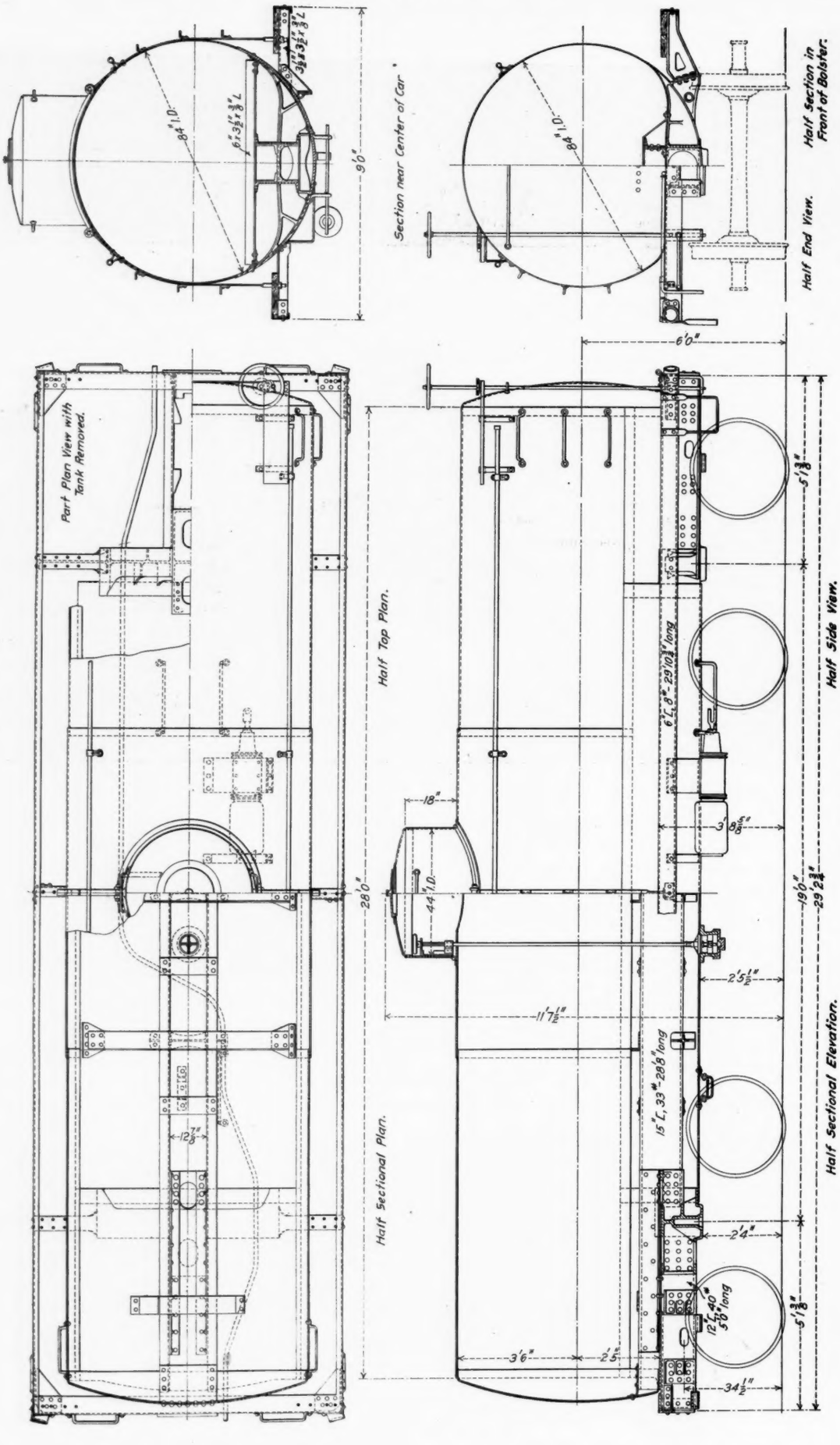


Fig. 5—Body Bolster for Tank Car.


Part Plan View with Tank Removed.
Half Top Plan.
Half Sectional Plan.
Section near Center of Car
Half End View.
Half Section in Front of Bolster.
Half Side View.
Half Sectional Elevation.
84" I.D.
90"
6'0"
28'0"
19'0"
29'2¾"
5'1⅜"
18"
44" I.D.
3'8⅝"
2'5½"
11'7½"
2'4"
3'6"
2'5"
34½"
12⅞"
6 @ 3½" = 21"
6 @ 3⅜" = 20¼"
6 @ 3⅝" = 21¾

scribed, it is proposed to construct a steel underframe somewhat on the same plan, but to fill up the space between the circular shell and the top of the 8-in. channels with cross timbers for the support of a wooden floor, and make the upper structure of the car like a box car. Such a car could be used for grain or flaxseed. Designs are being made for the application of this form of tank bottom and underframe to locomotive tenders; it will have the advantage of reducing the height of the center of gravity and will prevent derailments due to this as well as by the more gradual movement of the water sidewise on the circular sheet. These improvements were designed by H. C. Priebe, consulting engineer for the Chicago Steel Car Co.

THE BILLS OF LADING CONTROVERSY.

On June 6, after three years of discussion, the House of Representatives passed a bill which made railway companies liable for the acts of their agents in issuing all bills of lading, regardless of whether or not the agents had received the goods specified in the bills of lading. The Senate referred the bill to the Committee on Interstate Commerce, but adjourned June 18 without passing it. The banking interests, and especially recently the foreign exchange banks of New York City, have been the chief promoters of a law to make railway companies liable for the acts of their agents in issuing these order bills of lading, and conferences are now taking place between the bankers and railway men at which it is expected that some working arrangements will be made. The United States Supreme Court, in the Freidlander case, held that a railway company was not liable, under the common law, for unauthorized acts of its agent, and that, therefore, since the agent is not authorized to issue a bill of lading until he receives the goods covered by the bill and has himself verified the proper delivery of these goods (and every one who deals with the agents knows this) the railway company could not be held liable on what are known as accommodation bills of lading.

As a matter of fact, it is only a very small part of the total number of bills of lading issued by the railway companies that the bankers are directly interested in. It is estimated that only about 2 per cent. of the total number of bills of lading are shippers' order bills; the remaining 98 per cent. are what are known as straight bills of lading and are non-negotiable. Even of the negotiable bills of lading only a very small part are used as a basis of obtaining credit, and in the hearings before the Senate Committee, which were being held on the House of Representatives bill of lading bill, just before the closing of the last session of Congress, it was pretty clearly shown that the real grievance that the banks had was in regard to order bills of lading representing *cotton* shipments destined to points abroad, although they also complained of grain bills for export shipments. Nevertheless, the volume of this cotton business alone, measured in dollars and cents involved, is so great that the question is an extremely important one to the country. The failure to reach an understanding on this matter might even necessitate shipments of gold to Europe at a time when the same money was badly needed in the West to move the crops. The bankers, for instance, testified that during the coming cotton season it would be necessary for them to finance drafts on foreign banking houses secured by bills of lading representing cotton shipments amounting to about $600,000,000. The direct profits to the banks, figured on a percentage basis, are not very great on this cotton financing, a delay of a few days and consequent loss of interest being enough to wipe out all profit on the transaction. Nevertheless, for the proper handling of the cotton crop it is vitally necessary that the banks be able to advance this money without too great risk, and at the same time it is absolutely necessary that foreign bankers shall in their turn be willing to honor drafts drawn on them by cotton shippers and secured by bills of lading.

The direct and great importance to the railways of this cotton bill of lading question lies not so much in the importance of the direct question involved, that is, in the security of order bills of lading for cotton shipments, as in the possibilities of such general legislation as was threatened by the Stevens bill that was passed by the House of Representatives. This bill did not specify any particular kind of bills of lading on which the railways could be held liable, but contained the sweeping provision that railways should be held liable on all bills of lading. The bankers, in urging the Senate committee to pass the House bill, laid great stress on the fact that the credit of American cotton shippers' drafts accompanied by bills of lading had been thoroughly undermined by the recent exposures of frauds in the Belton, Tex., case, the recent Albany case, and the Knight-Yancey case. It is, however, doubtful whether the House bill would have covered but one of these three cases.

The method of procedure in financing the cotton crop is somewhat as follows: A local firm sends representatives out through the cotton districts, and these representatives buy up, for cash, shipments of cotton from the cotton raisers. The shipments move from the plantation to the compress on bills of lading which may be used, and in many cases are used, by the agents of the cotton firms to obtain cash from the local banks to be used in buying more cotton from the planters. When the cotton arrives at the compresses, in many cases owned by the railways, the local bills of lading are, or should be, surrendered in exchange for compress receipts, which are in turn exchanged for foreign order bills of lading drawn to the order of the cotton shipping firm and calling for the shipment of the cotton to Liverpool or some other foreign city. These bills of lading are attached to a draft drawn by the cotton shipping firm on a Liverpool bank, for instance, and this draft, with its bills of lading, is in turn attached to a bill of exchange on New York, on which the local Texas or Mississippi bank advances money to the cotton shipping firm. These two drafts, the one drawn on New York being endorsed by the local bank, are sent on to the local bank's correspondent in New York City, where the New York bank pays its correspondent's draft. This closes the transaction as far as the local bank is concerned; its liability has been canceled and it has received the money that it advanced to the cotton shipper. The New York bank is now in the position of having advanced the money to the cotton shipper direct, and holds as security a draft on a Liverpool bank with bills of lading attached. It then ships the draft with the bills of lading to Liverpool, and when the Liverpool firm has accepted the draft the New York bank's liability does not cease. He simply has the added protection of the foreign banker's acceptance. But between the time that the New York bank has paid its correspondent's draft and the time that the Liverpool bank accepts the draft drawn on it by the cotton shipper the New York bank is responsible for the entire amount that has been advanced, and has as its only security the bills of lading. The difficulty at present is that, in the first place, the New York banks don't want to assume this responsibility, and, in the second place, the foreign bankers have become so suspicious of the genuineness of the bills of lading that they refuse to accept drafts unless the American bankers will virtually guarantee the genuineness of these bills.

The bills of lading may be worthless; first, because, although issued by the proper representative of a railway, they do not represent actual cotton that the agent has ever received. This may be because the cotton shipper was dishonest and succeeded in tricking the agent into issuing bills of lading against shipments which were never delivered, or it may result from a shipper's getting a bill of lading for cotton which he fully intended to deliver to the agent but for some reason was unable to. In either case the bill of lading itself is apparently genuine. A different situation arises when a dishonest agent conspires with a shipper to give him bills of lading for goods which are not delivered, and the agent and the shipper may jointly share in the money derived from this fraud. It is not so plain in this case whether the bill of lading is or is not a genuine bill; that is, the courts might hold that it was a forgery. Two of the cases especially mentioned by the bankers at the Senate committee hearing,

however, did not come under these heads. In the Texas case the goods were actually received by the railway company, but the agent allowed the removal of these goods by third parties without the surrender of the original bills of lading. In the Knight-Yancey case, apparently, the bills of lading were simply manufactured; the agent had nothing to do with them, and the railway could not under any conceivable circumstances have been held liable.

It is conceded by bankers that the laws of forgery and fraud cover cases where some one other than the railway agent makes a false bill of lading as fully as they can be covered. The avowed object of the Stevens bill was to hold the railways responsible for goods mentioned in the bills of lading *issued by railway agents*. The trouble with this House of Representative bill, from the point of view of the railways, was that it made them responsible for *all* bills of lading, and it made it possible for a dishonest agent to conspire with some outside party and defraud the railway out of very large sums of money. In other words, it would have made it possible for an agent working at a way station in the backwoods of Mississippi on a $70 a month salary to bind his railway to pay thousands of dollars on bills of lading on which he himself might raise money and then decamp.

The position taken by the railways is that this is not a subject for legislation. The railways are apparently willing to concede that something must be done to strengthen the credit of order bills of lading for cotton. They claim, with a good show of reason, that if the local banks took ordinary precautions to investigate order bills of lading brought to them attached to a foreign draft it would be easily possible to determine the genuineness of the bills before sending them on to New York. The New York banks hold, with an equal show of reason, that it is utterly impossible for *them* to verify these bills of lading. The drafts and bills of lading come to them in great bundles and must be accepted or rejected at once. The whole trouble seems to be that while theoretically the railways ought to issue bills of lading only against goods which they have received, and, theoretically, banks ought not to accept negotiable paper from parties whose financial standing they have not in any way investigated, nevertheless, in practice the railways, for competitive reasons, or because they have to do business in Texas as the Texans do it, cannot always refuse to give what are called accommodation bills of lading, and in practice the New York banks cannot always put it up to their local correspondents to investigate the financial standing of cotton shippers, although in the Knight-Yancey case an investigation had been made.

Two ways have been suggested by which the credit of cotton bills of lading can be strengthened. First, surety companies may guarantee the genuineness of bills of lading. There has been some talk of a number of surety companies combining and jointly undertaking the guarantee of these bills; but the expense involved would be considerable. More than this, such an arrangement would not fit in with the ordinary business methods of a railway and it is very doubtful how it would be viewed by the Interstate Commerce Commission. Another suggestion is that the railways have a special form of stamped paper, identified by consecutive numbers, which agents should be authorized to affix to order bills of lading of cotton.

The stamp, for which a certain charge might be made, might read somewhat as follows:

"SPECIAL LIABILITY STAMP.

".....Bales of Cotton.

"Good only if affixed to bill of lading dated and issued at ....., Louisiana, during seven days beginning September ....., 1910, by station-agent of N. & S. R. R. Co. at said point.

"Not valid unless aggregated number of bales represented by stamps corresponds exactly with number of bales in bill of lading.

"Anything in the bill of lading to which this stamp is affixed to the contrary notwithstanding, said carrier issuing such bill of lading will be responsible to the lawful holder thereof for the value of the property therein stated to have been received for shipment, whether or not said carrier shall have actually received said property for transportation."

This form, which has been suggested by Robert Walker, of the Rock Island, in a memorandum covering the points under discussion would be a contract by which the railway company voluntarily makes itself liable for the receipt and transportation of the goods named in the bill of lading when these goods correspond with the goods called for by the stamp. These stamps could be made to cover one, two, five, etc., bales of cotton, and could each bear the signature of the traffic manager of the railway. They could be issued to local agents in small quantities and the local agent could be held responsible for their use. It would be a comparatively simple matter for the general freight office to check up the stamps issued by the agent with the stubs of these stamps as shown by the books in the general freight office. The banks could then refuse to accept any bills of lading without stamps attached, and the bills of lading, with these stamps attached, would carry the credit of the railway company with them and ought to be acceptable to foreign bankers.. Moreover, under the proposed system, it would be very much harder for a dishonest agent or a dishonest cotton firm to issue fraudulent bills of lading than it is at present.

In thus assuming voluntarily a liability which the common law does not fix on the railway, the railway officers recognize that such a change may mean additional expense. The southeastern roads in particular feel that to ask them to increase operating expenses without any direct return from such an expenditure is asking a great deal at the present time. Nevertheless, some of the railway men who have taken part in the conferences with the bankers do not think that this added responsibility, even though it involved some additional expense, will be an unmixed misfortune to the railways in the long run. It seems evident that it will involve a more careful selection of station agents, and possibly a correspondingly higher wage paid these employees. At the same time it will make necessary an improvement in the business methods of the local freight agent; it will teach him not to deliver freight to some person who put in a claim for it but can show no order bill of lading. There are any number of agents at present who are lax in this respect, and the railway company in every such case where a second party later presents an order bill of lading is simply liable for the value of the goods, and its only remedy is to discharge the station agent, which is not very satisfactory and certainly does not help make up for the money loss.

It seems particularly fortunate for the railways that the Senate did not pass the House of Representatives bill. The bankers will be compelled, during the present cotton season, to get along without legislation, but this will give a chance for the trying out of any scheme which the railways or the bankers may decide is feasible, and it will depend largely on how carefully the railways prepare and follow out such a scheme as to whether or not the agitation for a law in regard to bills of lading is renewed at the next session of Congress. Shippers as a whole do not require any such law, so that politics for once may be eliminated; it is only the special interests engaged in a special kind of business that have definite requirements. The railways have therefore the very unusual opportunity of demonstrating their ability to solve their own problems without that federal "regulation" which is tending towards federal management.

Von Breitenbach, the Prussian minister of public works, said in the Prussian House of Lords recently that about 35 per cent. of the ties used are steel, and that there has been little change in this proportion for the last five years, and none is intended, as they are advantageous only where there is broken-stone ballast, which is not attainable on a large part of the Prussian lines.

TRAIN ACCIDENTS IN JUNE.[1]

Following is a list of the most notable train accidents that occurred on the railways of the United States in the month of June, 1910. This record is intended to include usually only those accidents which result in fatal injury to a passenger or an employee or which are of special interest to operating officers. It is based on accounts published in local daily newspapers, except in the case of accidents of such magnitude that it seems proper to write to the railway manager for details or for confirmation:

Collisions.

Date.	Road.	Place.	Kind of Accident.	Kind of Train.	No. persons reported Kil'd.	No. persons reported Inj'd.
3.	N. Y., N. H. & H.	Gt. Barrington.	rc.	P. & Ft.	0	8
5.	Chic., Ind. & L.	Shelby, Ind.	rc.	P. & Ft.	0	20
†19.	N. Y., O. & W.	Parker.	bc.	P. & Ft.	3	25
19.	Balt. & Ohio	Somerset, Pa.	xc.	Ft. & Ft.	1	3
22.	Balt. & Ohio	Paint Creek.	bc.	Ft. & Ft.	2	4
†24.	Wabash.	Percy, Iowa.	rc.	Ft. & P.	1	30
29.	Ga. & F., G.,S. & F.	Valdosta.	xc.	Ft. & P.	0	14

Derailments.

Date.	Road.	Place.	Cause of derlmt.	Kind of train.	No. persons reported Kil'd.	No. persons reported Inj'd.
1.	Ches. & Ohio	Fayette.	d. track.	Ft.	3	0
5.	St. Louis & S. F.	Carbon Hill.	.....	Pass.	..	36
9.	St. L., I. M. & So.	St. Louis.	unx.	Ft.	3	12
16.	Pennsylvania	Ebensburg, Pa.	unx.	Ft.	0	10
16.	Pennsylvania	Mt. Union.	unx.	Pass.	..	..
19.	N. O. Terminal	New Orleans.	d. track.	Ft.	2	2
22.	Lehigh Valley	Freemansburg.	d. track.	Pass.	0	18
23.	Chic. & Alton	Carlinville.	d. track.	Pass.	0	17
23.	St. Louis & S. F.	Haverhill.	flange.	Ft.	5	10
23.	Pennsylvania.	Pottsville.	unx.	Ft.	0	0
24.	Wabash.	Percy, Iowa.	washout.	Pass.	..	..
28.	Cin., Ham. & Day.	Hamilton.	unx.	Ft.	0	3

The most fatal accident in the foregoing list was the derailment on the St. Louis & San Francisco on the 23rd. The persons killed and injured were trespassers riding on freight cars, said to be harvest hands.

The derailment on the Wabash on the 24th was followed almost immediately by the rear collision which is entered in the collision list as having occurred at the same place on the same day. According to the press despatches, the freight train came on and ran into the passenger train before the passengers had time to get out of the rear car. We have entered the casualties against the collision, though the accounts do not make it clear whether these were due to the collision or to the derailment.

The derailment at Mount Union, Pa., on the 16th appears from the accounts to have been a striking example of the safety of steel passenger cars, of which the train was principally made up. The train, which ran off the track, was running at high speed, and the cars were quickly thrown crosswise of the tracks and lodged afoul of the adjacent main track; yet no person was seriously injured. Moreover, a switching engine, drawing four freight cars, coming from the opposite direction, ran into the derailed cars, yet the worst result of this collision was to push the coaches aside a short distance.

In the derailment at Carlinville, Ill., on the 23rd, all of the cars in the train, except the rear car, were overturned. The tender was the first vehicle to jump the track.

The collision at Parker, N. Y., on the 19th is said to have been due to neglect of or misunderstanding concerning a despatcher's order by the engineman in charge of a pushing engine, which was running down hill light.

Of the five electric car accidents reported in the newspapers as occuring in June, only one appears to have been fatal. This was a butting collision in Steubenville, Ohio, on the 4th; two passengers killed, 14 injured.

A disastrous collision in France, killing 15 or more, and a derailment in Mexico, killing 20, have already been reported in the *Railway Age Gazette* (June 24, page 1,803, and July 1, page 46).

[1] Abbreviations and marks used in Accident List:
rc, Rear collision——bc, Butting collision——xc, other collisions——b, Broken——d, Defective——unf, Unforeseen obstruction—unx, unexplained ——derail, Open derailing switch——ms, Misplaced switch——acc. obst., Accidental obstruction——malice, Malicious obstruction of track, etc.——boiler, Explosion of locomotive on road——fire, Cars burned while running——P. or Pass., Passenger train——F. or Ft., Freight train (including empty engines, work trains, etc.)——Asterisk, Wreck wholly or partly destroyed by fire——Dagger, One or more passengers killed.

ELECTRIFIED STEAM ROADS AND ELECTRIC TRUNK LINES.*

The accompanying tables give data of the important railways on which electricity is used in heavy service. Only such figures are included as were conveniently available, and such omissions or inaccuracies as may occur do not detract materially from the forceful presentation of the extent and character of the use which is now being made of electricity in railway service. The horsepower ratings of the various motor cars and locomotives are in general the nominal ratings for a short period, usually one hour, but as these ratings have been adapted in some cases to the particular service in which the motors are to operate, they cannot be taken as a basis for an accurate comparison between the capacities of different equipments.

Single-Phase Electrification on Steam Railways and in Trunk Line Service.

Road.	Miles Of line.	Miles Single track.	Line voltage.	Motor cars No.	Motor cars H.p.	Locomotives No.	Locomotives H.p.
N. Y., N. H. & H.:							
Main line	21	100	11,000	4	600	41	1,400
New Canaan Branch	8	8	11,000	2	500	2	1,600
Grand Trunk	3.5	12	3,300	..	...	6	900
Erie: Rochester Division.	34	34	11,000	6	400	..	.....
Colorado & Southern: Denver & Interurban	46	46	11,000	8	500	..	.....
Baltimore & Annapolis: Short Line	25	30	6,600	12	400	..	.....
Swedish State Rys.	7	7	3,300 / 20,000	2	240	1	300
Midland Ry. of England.	8.5	17	6,600	1 / 2	300 / 360	..	.....
Prussian State	16.5	31	6,600	20 / 42 / 54	250 / 400 / 345	1	1,500
Lon., Brightn & S. Coast.	8.6	17.2	6,000	16	460	..	.....
Rotterdam-Haag-Scheveningen	20.5	46.5	10,000	19	360	..	.....
Spokane & Inland	129	129	6,600	28	400	6	500
						5	720
Midi Ry. of France	75	..	12,000	30	500	2	1,600

Continuous-Current Electrification on Steam Railways and in Trunk Line Service.

Road.	Miles Of line.	Miles Single track.	Line voltage.	Motor cars No.	Motor cars H.p.	Locomotives No.	Locomotives H.p.
New York Central	33	132	650	137	400	47	2,200
Pennsylvania	20	75	650	180	400	24	4,000
West Shore	44	106	650	20	360	..	.....
Long Island	42	125	650	137	400	2	1,200
West Jersey & Seashore	75	150	650	68	400	..	.....
Baltimore & Ohio	3.7	7.4	600	..	...	2.5	1,600
						5	1,100
Northeastern Railway	37	..	600	..	300	2	600
Mersey Tunnel	4.8	..	600	24	400	..	.....
Lancashire & Yorkshire	18	60	600	..	600	..	.....
Great Western	5	..	600	..	600	..	.....
Metropolitan Railway	..	67	600	56	600	10	800

Car equipment of Subway and Elevated Systems in American Cities.
The Direct-Current Third-Rail System at Approximately 600 Volts is Used in All Cases.

Road.	Miles of single track.	Motor cars. No.	Motor cars. Horse-power
Boston Elevated	19	219	320
Brooklyn Rapid Transit	71	558, 101	300, 400
Interborough Rapid Transit (New York)	190	969, 764	250, 400
Hudson & Manhattan (New York)	12	140	320
Chicago & Oak Park Elevated	19.4	65	320
Metropolitan West Side (Chicago)	51.1	15, 210	400, 320
Northwestern Elevated (Chicago)	25.5	20, 128	250, 320
Southside Elevated (Chicago)	36.5	150, 70, 150	180, 150, 110
Philadelphia Rapid Transit	11	100	250

Three-Phase Electrification on Steam Railways and in Trunk Line Service.

Road.	Miles Of line.	Miles Single track.	Line voltage.	Motor cars No.	Motor cars H.p.	Locomotives No.	Locomotives H.p.
Gt. Nor. (Cascade tunnel)	4	6	6,600	..	...	4	1,900
Italian State Railways:							
Valtelina Railway	66	..	3,000	10	400	2	800
						7	1,500
Giovi Railway	12.4	37.3	3,000	..	...	20	2,000
Mt. Cenis Tunnel	4.4	..	3,000	..	...	10	2,000
Savona Ceva	..	..	3,000	..	...	10	2,000
Swiss Federal Railways:							
Simplon Tunnel	13.7	14.3	3,000	..	...	2	1,100
						2	1,300
Garagel Santa Fe(Spain)	13.1	14.4	5,500	..	...	5	320

According to Washington, D. C., despatches, American bidders failed to get an order for locomotives for the Chinese railways apparently through the failure of manufacturers in this country to have trained technical representatives there who could give full specifications and explanations.

*An appendix to the paper on "Electrification of Railways," to be presented by George Westinghouse before the joint meeting of the American Society of Mechanical Engineers and the Institution of Mechanical Engineers.

CO-OPERATIVE ENGINEERING EDUCATION.*

BY HERMAN SCHNEIDER.
Dean of the College of Engineering, University of Cincinnati.

It is difficult to formulate a simple comprehensive statement of the principle underlying the co-operative system. Various attempts have been made to condense it into one sentence, as, for instance, "Hitching the school and shop abreast, rather than in tandem;" "Combining theory and practice." In former papers this statement has been used: "The practical side of engineering, that is, the technique, can be learned only in a shop working under commercial conditions, and the theory underlying the technique can be taught only in a school by skilled teachers." Perhaps the best statement of the fundamental idea is this: "The practice of engineering cannot be learned in a university; it can be learned only where engineering is practiced, namely, in the shop or field. The theory underlying the practice may be obtained outside of the university, but can be best obtained by an organized system of instruction under skilled teachers."

Many people think that the basic idea in the co-operative system is the alternate week arrangement. The plan by which theory and practice are combined and co-ordinated, is merely a detail, and the alternate week scheme which we use is the one which happens to fit our local conditions best. Even in our own school we are devising different systems of co-operation. For instance, after four years of experiment we have decided to operate the co-operative courses in electrical, mechanical and metallurgical engineering on the alternate week plan 11 months in the year, reducing the length of the courses from six years to five years. In civil engineering we have the alternate week scheme eight months in the year, and for the summer months we have made an arrangement with the Union Pacific, whereby our students obtain field work in railroading, together with instruction given by the railway company. In chemical engineering there will be a marked departure, according to our present plans, from both of these details of operation. It must be evident that, for different localities, different means of getting theory and practice together will be used, and, also, in different courses, the ratio of theory to practice will vary. For example, the University of Wisconsin probably could not operate on the alternate week plan, because of its distance from the factories of the state. It could establish a faculty in Milwaukee and have an alternate week or fortnight scheme; but if the faculty remained in Madison, the plan would probably be to have eight months of instruction at Madison and four months of scheduled shop work, with co-ordination, in Milwaukee, using four rotating sections so that the shops would always have the same quota of student apprentices. Such a plan as this would be a co-operative scheme, of course, but would have a less amount of shop work, and, in the opinion of some of our critics, would be a more beneficial arrangement than the one which we believe to be the best for our conditions in Cincinnati. Further, in co-operative law, medical, commercial, agricultural, architectural, or mining courses, it is evident that the amount and character of practice would vary greatly. I believe, and sincerely hope, that there will be many forms of the co-operative system adopted by different institutions, and out of all of these we shall probably get, by experiment, the best forms.

Four years of experience in operating our co-operative courses, however, leads me to expect failure for any co-operative scheme which is not made commercially profitable for the shops, which does not start the student at the very bottom of the practice of engineering, which eliminates the hard work that the regular mechanics do, or the regular hours they maintain, or which modifies the shop discipline simply because the apprentices are university students. Any attempt to evade the disciplinary conditions which have through the ages made strong men, while it may be an advance on the old four-year system, will not meet the expectations of its sponsors. These thoughts are born of the questions so frequently asked us by college teachers not situated in industrial centers, and by others who are in factory communities, but who have a vague fear that somehow the standard of their scholastic work, their dignity and their independence will be jeopardized by contact with the wicked world.

It is astonishing how much opposition there is to that part of our system which requires a student to do the hard physical work of laborers and mechanics. Engineering professors, particularly, seem to feel strongly that the high plane upon which the engineering profession is supposed to be, is in danger of being let down a peg, if embryo engineers begin their careers as apprentices. I have never been able to get a crystallized, logical statement of these objections. Personally, I believe that a goodly amount of physical work in contact with those whose lot it is to labor should be required of every young man in his formative years, no matter what his position in life is, or is to be. Especially should it be required of future engineers. Strong men have always grown stronger and better through this contact and competition, and the weaker ones find their levels more quickly than in any other way. Why an engineering college should not adopt nature's rigorous methods of finding leaders is not evident, and if engineering education should be for any particular purpose, it should certainly be for the training of leaders in production and construction. Surely a youth approaching manhood who does not feel within him the craving to measure his strength of body and mind with those who do the day's work lacks certain qualities necessary for leadership, and should not, therefore, get the training intended for leadership. If he does have the craving let him satisfy it; let him grow naturally, guide his growth and supplement it with proper intellectual instruction. In our opinion the man who has not the will and willingness to do physical labor in the practical engineering world is not a promising candidate for the engineering school; nor do we believe that imitation work in imitation shops should be offered to the students as an equally good, but easier and more dignified, substitute for the character-building, man-making, real work of real shops. Indeed, there is a sort of academic snobbishness, most unwholesome for the students, and most undemocratic in its essence, which looks askance at all knowledge that does not come by the book, and which feels that between the practical and the intellectual there is a great gulf fixed.

Now I assume that we are in the business of training men for the practice of engineering; and I further take it that the practice of engineering means the economical use of the forces and resources of nature for the benefit of mankind. The day has come when we must place honest emphasis on the word "economical;" we must also remember that mankind means all men, the majority of whom are those who produce and construct in using the resources of nature. We are, in fact, servants of each other, and in this mutual but complex interdependence of production we have for some time been leading surely to a crisis, which grows more acute as the nation becomes more industrial, and which will necessitate the solution of two problems: First, the elimination of waste in production, and second, the scientific use of labor to the end that it may be most efficient, best rewarded and properly conserved. These are matters not for the lawyer and politician, but for the engineer. That day is passing when the magnificent waste of men and materials can be an ignored consequence of achievement. The integration of a multitude of shop errors between the limits of January 1 and December 31 is now as much an engineering problem as the most delicate deduction in calculus. The training necessary to find all the factors which enter into this integral equation is just as much a part of engineering education as is mathematics. A working knowledge of the toxins of fatigue is as important, to say the least, as an ability to discover and eliminate the impurities in castings. To conserve the years of labor is as much a part of economical engineering as to find a good preservative coating for bridges. A knowledge of the limitations, the weaknesses and the group subtleties of men is as requisite as a similar knowledge of materials.

If we are to have a saving solution of this broad engineering problem of conservation in production, the men who tackle it must be initially aggressive in spirit and keen of mind; they must be deeply versed in science; they must have a thorough

*From a paper read before the annual meeting of the Society for the Promotion of Engineering Education, at Madison, Wis., June 25, 1910.

and intimate knowledge of men and materials; their instruction in the humanities must give them breadth of vision, with resultant breadth of tolerance. They must know the problem.

In joining with producing and constructing concerns to train young men for this type of engineering activity we anticipated that there would be a reflex action on the engineering college. The reaction was not slow in coming. It was more in the nature of a flareback. My telephone was very busy that first half year: "That cub you sent down here," the voice would say, "thinks this is a university. He won't work." It did not take us long to learn that it was necessary to paint the shop end of the course to aspiring Edisons in broad, black, greasy, sweaty strokes. One after another young men came to inquire about the work and one after another they would surrender to their mental aversion for early hours and much grime. But there was a fine residue from the sifting, a residue that meant business. Each year our list of applicants has grown and the selection has been more and more rigid; as a result our losses during the summer tryout decreased as the following table indicates:

Losses During Summer Trial Period.

Year.	Per cent.	Year.	Per cent.
1906.....	40.0	1908.....	13.6
1907.....	28.4	1909.....	8.1

We also learned that first year, and have had it verified each year since, that the shop will spot a yellow streak in a man before the university even suspects it. An attempt to sneak spoiled work through is never a great success. It is not even a commendable failure and the rest of the workmen view it with tersely expressed disgust. It requires only a few days for a young man to realize that he must stand squarely on his own merits and that most of the men in overalls about him are a peculiarly keen lot of men worth cultivating. And this is when young Edison begins his combination course in tact and integrity.

We at the college end soon found our work under a scrutiny and criticism, with final judgment suspended, and this, too, from a source which does not hesitate to scrutinize and criticise. We are brought face to face with the failure of a university department as we never are in our four-year courses. A student, let us say, has finished successfully his work in physics; some day he does a fool thing in the shop which indicates that he knows very little about the subject. When confronted with it and with the fact that he should have known better because he had been taught the theory governing it, you find his grasp on the theory to be very feeble. It is not a part of his working organism.

Experiences of this sort caused a serious introspection on the part of our teachers, and a consequent re-adjustment of our courses and methods. We soon found that much of our trouble resulted from a lack of co-ordination between courses. After trying various plans to remedy this, we now have a system whereby each course is charted in a circle clockwise by weeks. At the periphery of the circle are the names of the teachers who tie to the particular work of any week. Every teacher gets a copy of every course chart. The instructor in charge of the course is chairman of a committee on that course, the other members being those whose work correlates with his. In this way a number of men may teach a subject which was formerly taught by one man. For example, the professor of metallurgy enters the bridge design and testing laboratory courses at appropriate times; the professor of industrial chemistry gives part of the course in cement.

Experience also taught us that it was necessary to have a separate set of men to co-ordinate the work of the shop with the work of the university. A department was started to do this and men were appointed of the grade of assistant professor and with the title of co-ordinator. The shop co-ordinator is a college graduate acquainted with shop practice. He spends every morning at the university and every afternoon in the shops. His function is to make a direct weekly co-ordination of the work of the shop with the theory of the university. One afternoon, for example, he may be at the shops of a local manufacturing company, where he will observe the student apprentices at work. He will know what they are turning out, their speeds, their feeds and cuts, the angle of the tool, how the batch of work is ticketed, how the work is set up, the power drive, everything important in connection with the operation. The next week these young men will be grouped together with their classmates for two periods in class, when he will explain the functions of the particular parts, on which the students were working, in the machine which the local manufacturing company builds. He will take up all questions of speeds, feeds, cuts, accuracy, etc. Figuratively speaking, he will take from the student apprentices the blinders which would restrict their vision except for this explanatory work. The ticketing of the batch of work is gone into and the system of shop routing is explained. Ultimately all problems of shop organization, shop accounting, cost keeping, shop planning, power transmission, heating, lighting, etc., are discussed.

In conjunction with this, a card system is employed by means of which everything the student does in the shop that exemplifies a theory taught in the university is called in detail to the attention of the teacher of theory, so that when the student comes to that particular theory the exemplifications which he has had in his practical work in the shop are called to his attention. It will be seen, then, that out of the student's own experience is drawn much of his course in mechanism, thermodynamics, machine design, strength of materials, shop economics, etc.

This system has been in operation for one year and is one of the most valuable additions we have made to the scheme. The co-ordinators have made a careful study of each shop and are now completing organization charts showing the path which a student can most profitably follow through the shop. In addition to the shop chart, a chart is made for every individual student which indicates how closely this path has been followed and why there have been deviations, if any. These charts are the result of four years of closely observed experiment on the part of the university and the shops, and have been worked out by conferences between shop co-ordinators and shop superintendents.

Our critics have always felt that the amount of work given (six years) would tend to kill the scientific spirit and to instill a too practical one. A recent occurrence worth mentioning in this connection was a meeting of all the co-operative students with the faculty to discuss the 5-year, 11-month plan of operation. At this meeting the students who have been with us three or four years strongly expressed the hope that the course would be made six years long, 11 months of the year. None of the students wanted a six-year course, nine months of the year. When the vote was finally taken it was found that all the men who had had three or four years of the work wanted a six-year course, 11 months of the year, while the younger men were unanimously in favor of a five-year course, 11 months of the year. The reason given for their attitude by the older co-operative students was that they wanted to take up in the university advanced scientific work of a post graduate grade, together with certain academic subjects such as psychology and logic, and that they desired also to take a more comprehensive group of technical subjects than is usually given in any engineering course. That is to say, they have become so impressed in the shop with the broader aspects of engineering, that they desire to touch not only the technical subjects of their own courses, but also many of the technical subjects of other engineering courses. As a result, courses will be arranged so that men, graduating after five years, will be enabled to take one or two additional years if they so desire. This attitude was not surprising to those of the faculty who were watching the development of the co-operative students. A curious, and, I think, entirely unusual situation was developed in the meeting when nearly every speaker on the students' side solemnly warned the faculty that no measures should be taken which would in any way endanger the high standard of the co-operative course in the university.

Of course, our experience in four years of operation has enabled us to determine in advance that the usual work of the four-year theoretical courses could be carried on by co-operative students in five years of half-time work 11 months of the year, even though the standard maintained in the co-operative work is much higher than that of the four-year courses. A student's rating, by the way, is not determined by examination, but by a

record of daily efficiency. We have abolished examinations, but pay very close attention in the weekly faculty meetings to the weekly records of our co-operative students. Short written tests are given frequently and without advance notice. A certain pace is set and if the student cannot or will not maintain it he is dropped from the course.

We are more and more convinced that the best thing a university can teach an engineering student is how to tackle a problem, and to this end most of our summer work is devised. All of the summer work in the university is to be constructive following the analytical work of the previous year's theory. For example, the student's first problem will be something like this: "There is a barrel of rock salt; you are supposed to have a certain knowledge of theoretical chemistry after your year's work. Here is the laboratory; here, also are the necessary industrial implements; over there is the library. Now go and make four pounds of table salt. At 5 o'clock each day let us have a written report on what you have accomplished." Following this and other simple problems, the work becomes more complex, leading into boiler compounds and metallurgy. The student will be compelled to rely almost entirely on his own resources, except for critical suggestions following errors, and by the time he has reached his third summer it is hoped that he will be able to use the laboratory, the library and his theoretical knowledge to make a logical and effective attack on a new piece of constructive work. In his last year he will have several problems which will involve theoretical considerations that he has never met, except, perhaps, in the fundamentals of physics.

Many additional changes in curriculum and method are in process of development, looking to a more rigorous mental and physical training of our young men for work in production and construction. And though a few of our students upon graduation will become teachers of future co-operative students, and a few more, temperamentally fitted for work in pure science, will join the freemasonry of those who explore beyond the ranges of the known, the majority will continue in the more prosaic business of helping to do the world's work. And these will bring to their tasks a working knowledge of the many-sided life of the shop and field, coupled with an ability to apply it to the rapidly increasing fund of material which the pure scientists uncover, to the end that the yield may be greater and the spirit of the labor brighter. And this, I take it, is engineering.

TESTS OF SELF-CLEANING FRONT ENDS, PENNSYLVANIA RAILROAD.

The front end arrangement now in use on the Atlantic type passenger locomotives of the Pennsylvania is shown in Fig. 1. The outside stack is 16 in. in diameter at the base and has a taper of 1 in. in diameter per foot of height. The inside stack is not tapered. The diaphragm plate is perforated, with a netting covering the perforation, and has an adjustable plate on the lower edge. A large number of tests of various kinds have been made on the testing plant at Altoona with class E2a locomotive 5,266 equipped with this front end, and while it has been found to be a very good arrangement, so far as the steaming of the locomotive is concerned, it is not self-cleaning. With low volatile friable coal the accumulation of cinders in the front end may be as much as 1,000 lbs. per hour, a quantity that would seriously interfere with the draft and necessitate cleaning the front end after an hour's run. With high volatile gas coal the accumulation of cinders is not so serious, but even with this coal 300 lbs. of cinders, or more, may be collected and the smokebox must be cleaned at the end of each trip, where the locomotive is working to its capacity; burned front ends result if there is any air leaking after the cinders have collected.

Master Mechanics' Front End.—A committee appointed by the American Railway Master Mechanics' Association reported upon a series of front end tests made at Purdue University with a New York Central & Hudson River Atlantic type locomotive (Proceedings American Railway Master Mechanics' Association, Volume XXXIX, 1906), and as the conclusions from the results of these tests, certain suggestions for a front end arrangement for best results are given as follows: "A suggestion as to a standard front end is presented [Fig. 2] which, with the following equations referring thereto, may be accepted as a summary of conclusions to be drawn from all experiments made."

For best results make H and h as great as practicable. Also make

d = .21 D + .16 h.
b = 2d or .5 D
P = .32 D
p = .22 D
L (Not well established) = .6 D or .9 D, but not intermediate values.

These rules were used as the basis of the design of front end arrangements to be tried. No attempt was made, however, to have the length of the smokebox conform to that recommended, which would make it either 63 in. or 42 in., instead of the present 83⅝ in.

The Locomotives Tested.—An "E2a" class locomotive, No. 5,266, was used for most of the front end trials, but later some

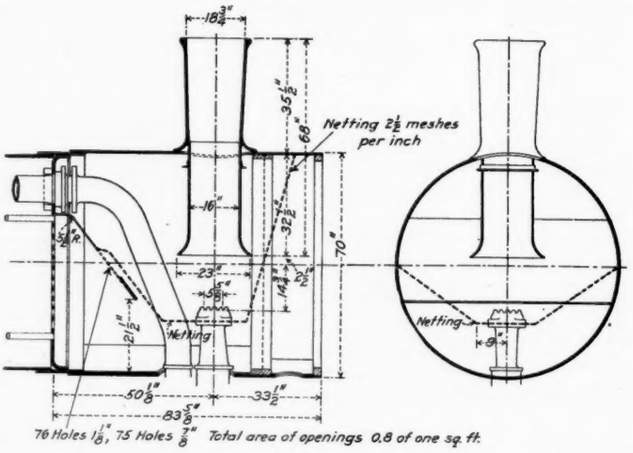


Fig. 1—Standard Front End; Pennsylvania Railroad Atlantic Locomotive.

of the devices were applied to "E3a" class locomotive, No. 2,984. The principal dimensions of these locomotives are as follows:

	E 2a.	E 3a.
General Data.		
Weight on truck, lbs.	37,167	33,700
" " front drivers, lbs.	53,334	56,700
" " rear drivers, lbs.	56,667	61,500
" " trailing truck, lbs.	37,000	31,200
Total weight, lbs.	184,167	183,100
Wheel base, driving, feet	7.42	7.42
Wheel base, total, feet	30.85	30.85
Cylinders.		
Diameter and stroke, in.	20.5 x 26	22 x 26
Valves	Double ported balanced shldr.	Richardson balanced.
Wheels.		
Driving, diameter, in.	80	80
Truck, diameter, in.	36	36
Trailing, diameter, in.	50	50
Boiler (Same on both locomotives).		
Type	Belpaire, wide firebox	
Boiler pressure	205 lbs.	
Diameter first ring	67 in.	
Firebox, width and length	114 x 68 "	
Tubes, number and outside diameter	315, 2 "	
Tubes, length between sheets	179.78 "	
Heating surface, tubes	2,471.04 sq. ft.	
" " firebox	156.86 "	
" " total	2,627.90 "	
Grate area	55.5 "	

Draft and Back Pressure.—In the tests made by the Master Mechanics' committee oil was used as fuel; by its use the admission of air to the firebox could be completely controlled and the effectiveness of any arrangement could be derived from the draft indications, the draft in the smokebox at any fixed back pressure being dependent only upon the smokebox arrangement. As the problem on the Pennsylvania was to devise an arrangement that would clear the smokebox of cinders, the use of oil as a fuel could not be considered and with coal as a fuel it was found impossible to duplicate draft readings under apparently similar conditions of running. By means of an indicator, connected to the exhaust pipe, a few inches below the nozzle, the back pressure was observed, and by running the locomotive under

gradually increasing loads a series of readings of the back pressure and the corresponding draft or vacuum in the smokebox were obtained. Tests indicated very clearly that the draft is so closely dependent upon the conditions at the grate that it cannot be used as a basis of comparison for different front end arrangements when firing coal.

In estimating the comparative merits of the different devices

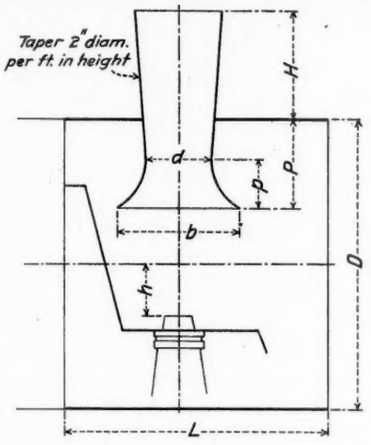


Fig. 2—M. M. Assoc. Front End.

tried it became necessary to take account of a number of factors, as:

The quantity of water that could be evaporated as compared with the standard front end.

The evaporation per pound of coal.

The general steaming of the locomotive as shown by the boiler pressure during a test.

From tests made with the standard front end it was known that the boiler could be expected to give an equivalent evaporation of about 16 lbs. of water per square foot of heating surface with low volatile friable coal and 18 lbs. with high volatile gas coal. To obtain the lower evaporation a speed of 160 revs. per minute and a cut-off of 27 per cent. was required with locomotive No. 5,266 with wide open throttle, and for the higher evaporation of 18 lbs., 160 revs. and 32 per cent. cut-off with full throttle. If the results with the standard front end could be equaled with a self-cleaning device the object of the tests would

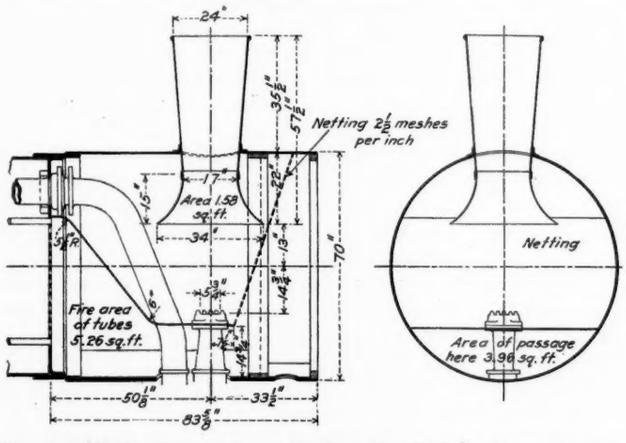


Fig. 3—M. M. Assoc. Front End as Applied to Pennsylvania Railroad Atlantic Locomotive.

be accomplished, as with the added advantage of a self-cleaning front, which would permit the use of a friable coal, the capacity of the locomotive would not be reduced.

Low volatile friable coal was used for the preliminary runs, as with it large quantities of cinders are drawn through the tubes and the self-cleaning feature could be better observed than with a coal making less cinders. The final series of tests were made with high volatile gas coal, as it is one of the regular passenger coals, while the other is not.

The Tests.—A large number of tests were made, including a series to show the effect of moving the front edge of the diaphragm plate in the standard front end (Fig. 1). The changes did not produce any marked effect, possibly because of

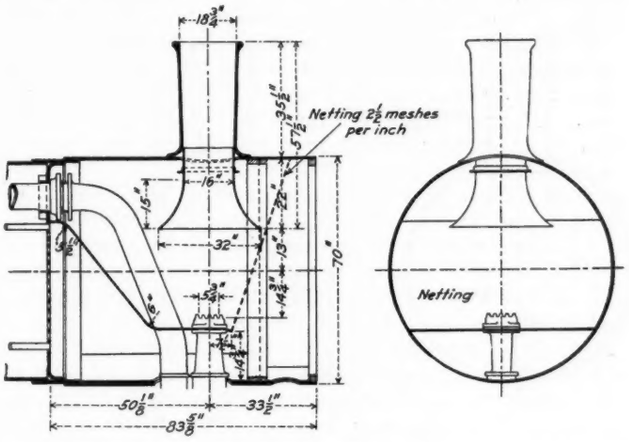


Fig. 4—Front End with Pennsylvania Railroad Outside and M. M. Assoc. Inside Stack.

the diaphragm being perforated. The tests of front ends made by the Master Mechanics' Association did not determine the arrangement of the diaphragm plate to make the smokebox self-cleaning and this was the object of the preliminary tests made by the Pennsylvania. First a diaphragm of the type recommended by the Master Mechanics' Association was tried without a netting. An inside stack, built according to the Master Mechanics' recommendation, was then substituted for the standard Pennsylvania stack and different diameters of nozzles were tried with the combination. Following this both the inside and outside stacks were made to conform to the recommended practice of the Master Mechanics' Association. The front of the diaphragm plate was then cut off until it extended only 7½ in. in front of the center of the nozzle. A large number of other combinations were also tried, and the three which gave the best results, and were self-cleaning, were selected for the final tests.

Final Tests.—After the preliminary trials of the various de-

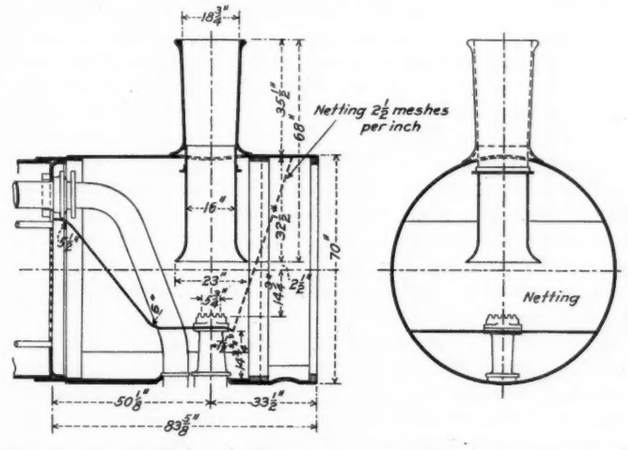


Fig. 5—Front End with Pennsylvania Railroad Outside and Inside Stacks.

vices three of those which were of greatest promise, Figs. 3, 4 and 5, were selected for further tests. Fig. 3 shows the front end recommended by the Master Mechanics' Association as applied to the "E2" or "E3" locomotive. It has a tapered stack with a wide mouthed inside stack. The diaphragm plate is without perforations and is carried down and forward to a point 7½ in. in front of the exhaust nozzle center. The edge of the

plate ends at a point 14¾ in. above the bottom of the smokebox and the area of the passage for the gases at this restricted point is three-fourths of the area of the tube opening or fire area. The tests made with these three arrangements were each of two hours' duration at 160 revs. per minute, or about 38 miles per hour. Good results were obtained with each of these arrangements, all being perfectly self-cleaning except for a slight accumulation of cinders on the horizontal plate of the diaphragm.

Tests with the arrangement shown in Fig. 5 showed a better evaporation per pound of coal than any of the others and it was thought, all things considered, that this was the best arrangement. Another test was then run with it to develop the maximum boiler capacity at 160 revs. and 32 per cent. nominal cut-off, and this test was run without difficulty. This is as late a cut-off as can be run with the standard front end at this speed, and as the nozzle was ⅛ in. larger in diameter than was used with the standard arrangement, it is to be presumed that the boiler capacity is as great with this self-cleaning front as with the standard, with the added advantage of slightly decreased back pressure in the cylinders due to the large nozzle.

After this maximum capacity test a trial was made at a very low rate of working under partial throttle to note the effect of such conditions on the quantity of cinders collected in the smokebox. This test, at a speed of 160 revs., 27 per cent. cut-off and the steam throttled to one-half the boiler pressure, showed practically no cinders collected in the smokebox.

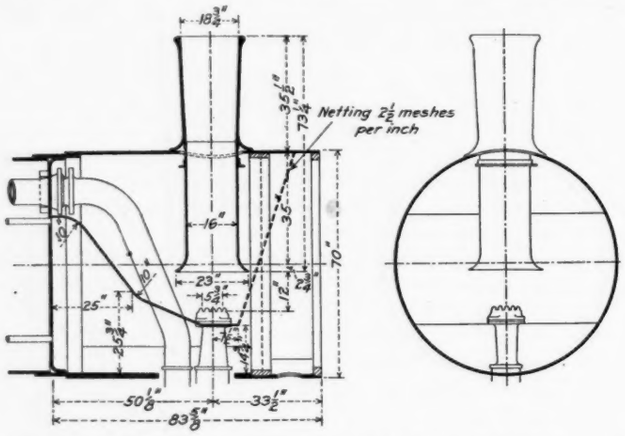


Fig 6—Front End Arrangement Which Gave Best Results on Atlantic Locomotive.

Tests With Different Firemen.—To show that the results obtained were not due to good firing alone, tests with the arrangement shown in Fig. 4 were run under precisely the same conditions, with the exception that one test was fired by the regular testing plant fireman and the other by an inexperienced man who had been firing but two months and had never fired this class of locomotive. The results show that the good steaming of the locomotive with this self-cleaning front can be obtained by the average fireman, but they also show that the inexperienced man may use as much as 750 lbs. of coal per hour over the amount actually required.

Self-Cleaning Front on "E3a" Class.—At this point, after tests which indicated that for locomotive 5,266, "E2a" class, the self-cleaning front, Fig. 5, would give the best results, it was thought best to determine if this arrangement would give equally good results if applied to another boiler of the same class. Locomotive 5,266 was, therefore, removed from the plant and put into road service, and "E3a" locomotive 2,984, fitted with the same arrangement, was placed on the plant. Though the tests were not quite up to the maximum evaporation of the other locomotive, one of them was but five-tenths of a pound less per hour and it is clear that the boiler will give the same results as the other with the same front end. Modifications of the diaphragm were then taken up to make it of such a shape that it would clear itself of the small quantity of cinders which had been collecting on it. The plate was made sloping, just back of the exhaust nozzle, where in the earlier form it had been flat. This modification of the form of the sheet did not have the desired effect.

The inside stack was then lengthened and the cinders were practically all cleared from the plate. The inside stack was then raised, as in Fig. 6, to a point 12 in. above the nozzle, to find the highest position for this inside stack that would clear the plate of cinders. Six shovelfuls of dry cinders were put on the plate and the locomotive run at a speed of about 120 revs. and a short cut-off for about 15 min., when the cinders were all removed; next, six shovelfuls of wet cinders were put in and these were also cleared from the plate.

Conclusions.—A front end arrangement has been developed for the "E" class which, while self-cleaning, maintains the boiler capacity or maximum evaporation fully equal to that with the standard front end arrangement. With friable coals, where large quantities of cinders are formed, the boiler capacity will be increased on long runs on account of the smokebox being kept clear of cinders, which obstruct the draft. The front end arrangement recommended for the "E" class of locomotives, Fig. 6, is to be used with an exhaust nozzle of 5¾ in. diameter. The outside and inside stacks as now used on this class of locomotive appear to give better results than can be obtained with the form recommended by the Master Mechanics' Association and it is thought advisable to retain them. The best results were obtained when the passage for the gases under the diaphragm was smooth and free from abrupt changes of form. The inclined adjustable diaphragm plate, often used, was found to cause an obstruction to the flow of gases and is undesirable. In the experiments made, the height of the whole horizontal plate of the diaphragm was varied and the final position recommended is suitable for any locomotive of this class and means for adjustment is not considered necessary.

ANNUAL MEETING OF THE FREIGHT CLAIM ASSOCIATION.

The nineteenth annual meeting of the Freight Claim Association was held at the Hotel Alexandria, Los Angeles, June 15 and 16, President J. S. Tustin (Missouri Pacific) in the chair, and about 130 representatives present.

The president in his opening address said, in part: We all recall the time when questions of liability, both as to a claimant and to interline relationship, were sifted through as many minds as there were separate carriers employed in the transportation of the property; but a few claim officers connected with closely related lines adopted what is called the single-audit plan, under which one mind determines the relationships on a claim involved in joint service; and where now is the carrier that may safely sit in splendid isolation—a law unto itself—on these joint claim problems? A patient tolerance of small irritations, while we strive for a perfect service, is a befitting attitude. It is true that each common carrier is itself responsible before the law for the validity of its own conduct and open to a separate challenge of government examiners, but this should not serve to beget a shrinking timidity resulting in the nullification of broad experience. The arbitration court of our association is doing important work. Nine years ago 35 claims were settled through arbitration in one year, and in the three years following 61, 57 and 71 claims. Within the last twenty-four months 1,037 claims were placed before this court—a voluntary tribunal of no mean importance. But it may be seriously questioned whether, without a systematic effort to minimize the burden, the association should continue indefinitely to call for this labor, a service little better than gratuitous. A recommendation will be made to codify the findings in these claims, to create an influence in the settlement of other claims without arbitration. Whether the solution is to be had by the selection of a permanent chairman, duly qualified to express a conclusion, influencing, also, it may be, the practice of arbitration, is a matter for the association to determine. * * * The valuable investigations con-

ducted by several claim groups, notably the Southeastern, New York and Chicago conferences, should be made available to the members of the association as a whole, probably by having their minutes printed at the expense of the association and distributed to our members.

Speaking of the work of the Conference Committee, which has had frequent conferences with representatives of the Interstate Commerce Commission, Chairman Tustin said: The first difficulty we met was the indefinite character of our work. "What are we here for? What are the functions of the Conference Committee?" If we had listened to all criticisms the whole movement would have been emasculated and we should have gone to Washington and adjourned home. But the committee formed certain convictions and we had the courage to put them into practice. Our work is summed up in this little pamphlet, which is the condensation of about five hundred pages. We did not think you would want to read the five hundred pages and, for economy of time, we did not print everything. Here on page five of the report, covering the marking of cotton, is an illustration of some of the things we took hold of. There are a great many carriers to which this subject does not appeal at all, because they do not haul any cotton. A lot of freight claim agents do not know what cotton is, and yet it is a living issue with us. We sweat blood on this cotton proposition. * * * The railroad commissioners of the United States are much concerned over this question of freight claims and they propose to hold around the United States a lot of public hearings on this question. When this movement started I began by writing letters to certain traffic associations—merchants' bureaus and merchants' leagues—to see what they thought of the progress of the claim business in the United States. That was followed by letters to individual shippers, importers, exporters, jobbers and wholesalers. The next fleet of letters was sent to the traffic people all over the United States. I sent out 800 letters to find out what the country merchant thought of the progress of the claim settlements of the United States; and I was astonished with the unanimity of opinion that progress has been made in the last three or four years that is almost revolutionary in its scope. First, I had the testimony of the shipper, or rather of the merchants' leagues; second, the testimony of the individual shipper; third, the testimony of the traffic men; and, fourth, the testimony of our agents, who were in touch with the small merchants at our little country towns. It is the small merchant at the little country town that makes or ruins our reputation as claim agents. With a big industry it is usually easy to deal. In all probability its claim agent is an ex-railway man and knows how to get at it; he is not the man who goes before the legislative bodies in behalf of incendiary legislation. At all events, he is not likely to. But here is a little fellow at a little country town who buys a stock of groceries and who has a vision in his mind of what he is going to do with his groceries when he gets them. He is going to open a box of oranges and put them here, and a pail of tobacco and a bucket of candy there, to make a display; but on the way the box of crackers becomes broken and somebody steals some of the oranges and the pail of candy is broken and the candy smeared on the car floor, and the man's dream is dissipated; there is a sense of outrage; and apparently back of that situation, in his mind, is the great corporation, and he reads in the papers about fifty million dollars of bonds and 100 million dollars of bonds and Wall street and all that colossal matter, and he thinks all this is arrayed against his little pail of candy and himself. So, in thinking over this question, I began to realize how the little country fellow feels; how he talks; what he says to his family; what he says to the man who is trying to make the laws in Topeka or Little Rock. He is the man who wants to go to the state capital and whose voice is heard in radical legislation.

I asked the agents if other roads paid their claims quicker. I said I hoped they did, because we needed that stimulus. Some said, "You are pretty quick, but the Rock Island is just as quick and the Santa Fe is just as good." And that is what we want to work for—not to be better than the worst, but to be just a little better than the best. It was a happy day when the Government issued that pamphlet on packing. It was the entering wedge. It has been declared that for all-around carelessness the American shipper takes the palm. For the year ending 1908 twenty-eight and a half millions of dollars were paid out for loss and damage to freight, exclusive of payments by switch and terminal carriers. That was two years ago. Meantime payments have increased and I venture to say that when the new compilation is out for this year it will exceed the startling figure of $30,000,000, which is 4 per cent. on $750,000,000. * * * Your conference committee has tried to keep open the highway of governmental co-operation. That has been the conception we have had of our job. * * * There have been two or three bills before Congress this session proposing to penalize carriers if a claim is not paid within sixty or ninety days. The speaker here told of the efforts of the committee to secure reasonable action by the Congressional committee.

Following Mr. Tustin's remarks the meeting took up and acted on a number of committee reports. Article VI of the Constitution was changed so as to provide for only four standing committees, viz., on Constitution and By-Laws, on Loss and Damage Rules, on Overcharge Rules and on Methods and Topics. The Committees on Car-Sealing Devices and on Uniform Blanks are abolished and their duties added to those of the Committees on Loss and Damage Rules and Overcharge Rules.

The membership of the Committee on Methods and Topics was increased from five to nine, thus making all of the standing committees composed of the same number of members.

Provision was also made for each member of the standing committees to be appointed for a term of years, varying from one to three years, which plan it was thought would result in increased efficiency in the work of those bodies, making them more permanent in character.

Article VII of the Constitution was amended to provide for three regular arbitration committees of three members each (there having previously been one regular and two special committees), all of which are on the same footing, with the same powers.

These changes in Articles VI and VII were made effective at once.

The second paragraph of Loss and Damage Rule No. 40 was amended to read as follows, effective July 15, 1910:

"All claims for damage or for loss of a package or loss from a package, not exceeding $20, and not provided for in the first paragraph of this rule, shall be prorated from point of shipment to destination upon mileage basis unless the record of checking at destination, junction or break-bulk point locates the damage or loss; in which event claims shall be prorated from last point at which shipment checked in full and good order to point where damage or loss is discovered. No investigation further than the development of the above records of checking shall be permitted. Subject to Ruling W-2. Minimum distance for any carrier to be ten miles.

"This rule to apply on all unsettled claims."

This rule has caused the members a great deal of trouble during the past few years, being interpreted in many different ways, but it is hoped that the conclusion reached at this session will prove satisfactory to all.

In receiving the report of the committee on car-sealing devices, a resolution was adopted referring to the American Railway Association the whole question of improvements, from a standpoint of strength and security to lading, in seals, car doors, fastenings and equipment generally as at present used.

The following officers were elected for the ensuing year: President, J. S. Tustin (Missouri Pacific); first vice-president, W. L. Stanley (Seaboard Air Line); second vice-president, F. E. Shallenberger (Star Union Line); secretary and treasurer, W. P. Taylor (R., F. & P.), Richmond, Va. Mr. Tustin was also chairman of the Conference Committee during the past year and was likewise reelected to that position.

The Conference Committee of 22 members was continued for another year, to continue its work along the same lines as during the year just closed.

The following members were elected to constitute the three

arbitration committees, each group of three as shown being designated to work together as one committee, the chairmen having been designated by the president, viz:

G. C. Arnold (chairman), (Lehigh Valley); W. H. Hancock (Union Pacific); R. C. Hancock (St. Louis Southwestern of Texas).

R. K. Slaughter (chairman), (Chesapeake Steamship Co.); H. F. Bidwell (Boston & Maine); W. O. Bunger (Chicago, Rock Island & Pacific).

J. L. Eysmans (chairman), (Cumberland Valley); J. M. Eedson (Michigan Central); E. Arnold (Grand Trunk).

The following Appeal Committee was elected, the first named being designated chairman by the president, viz:

J. J. Hooper (chairman), (Southern); A. B. Thompson (D., L. & W.); G. W. Perry (Great Northern); A. R. McNitt (Oregon Short Line); J. M. Brewer (Southern Pacific).

St. Paul, Minn., and June 21, 1911, were selected as the place and time for the next annual meeting.

NEW CHICAGO STATION OF THE CHICAGO & NORTH WESTERN.

The new passenger station which the Chicago & North Western is building at Chicago will be one of the largest terminals in the United States. A general article about the plans for this station, illustrated with perspective elevations, was published in the *Railway Age Gazette,* August 14, 1908. In our issue of July 16, 1909, a description was given of the general structural features, together with views of the cross section of the train shed, and on February 11, 1910, some progress views of construction were shown. The Bush train shed was described March 17, 1910, and on March 18 we gave a full description of the revision of grade of the Chicago & Oak Park Elevated's line at the entrance to the terminal. The present article is intended to bring up to date the facts about the construction of the station.

The estimated cost of the terminal is $20,000,000. It is expected to have it completed and ready for use at the end of the present year. Here will center all the passenger traffic of the North Western lines which now goes through the Wells street station. At the present terminal there are handled daily 310 passenger trains, of which 70 per cent. are suburban. The number of passengers using the station on a certain day in April of this year was as follows: Suburban, 35,305; through, 8,443; total, 43,748. This represents about the average.

The Wells street station is on the north side of the Chicago river and all the trains entering it are brought over one bridge spanning the north branch of the river. The new station is several blocks west and south of the Wells street station and no bridge crossing is necessary. As shown on the ground floor plan, Fig. 1, the station extends from the north side of Madison street to Milwaukee avenue, crossing Washington street, Randolph street and Lake street, and having a total length of practically 1,670 ft. This length is divided as follows: From street line on Madison street to face of building, 33 ft.; main building and concourse, 218 ft.; train shed, 893 ft. 9⅝ in.; from end of train shed to south line of Lake street, 181 ft. 6¾ in. The tracks of the Oak Park Elevated cross the terminal tracks on an elevated structure in Lake street. The power plant of the new terminal is placed in the triangle between Lake street and Milwaukee avenue, the width of Lake street being 80 ft. and the length of the triangle on the west side being about 261 ft. The total over all width of the terminal is 320 ft.

The old style high roof is conspicuous by its absence in this terminal, the roof being masked by masonry walls 48 ft. high on Canal street and Clinton street. The Bush train shed, Fig. 2, is used, this style providing for curved roof over the platforms with narrow openings over the middle of each track so the smoke is carried out of the train shed. The roof is of steel frame construction, covered with concrete, the smoke ducts being plastered on metal lath. Fig. 4 shows almost the entire length of the train shed in process of construction and the Oak Park Elevated at the north end. Fig. 5 is an interior view showing the floor construction of concrete, recessed for the tracks. The framework of the structure is steel, but concrete is used largely throughout to protect the steel and form all the floors. Fig. 6 is a view of the massive column construction under the train shed and Fig. 7 is a view from above, showing the framing and the beginning of the Clinton street wall. The bumpers are at the south end of the train shed next to the concourse in the main building.

Fig. 8 shows the waterproofing of the subway bridge over the tracks at Kinzie and Clinton streets, and is illustrative of the general method followed in such work in connection with the terminal. Streets were crossed at various angles. Many awkward intersections were met. So the work was decidedly complicated and many special plans were prepared.

The floors of the bridges and subway crossings in general consist of steel trough girders filled with concrete, which were put in rather wet. This was smoothed off and waterproofed with membrane and asphalt waterproofing. The contract approximated 500,000 sq. ft. of surface and was awarded to the Standard Asphalt & Rubber Company, Chicago. The concrete was a 1:2:4 mix and after it was dry and set the surface was cleaned thoroughly and covered with a coating of Sarco concrete primer, this being very thin and intended to sink into the surface voids and assist in binding the waterproofing. When the primer dried the surface was covered with a heavy coat of No. 6 Sarco waterproofing, heated to a temperature of 400 deg. Fah. and swabbed on with mops. Upon the hot waterproofing was laid a layer of 8-oz. open mesh burlap in strips 40 in. wide, a coat of the waterproofing being swabbed on this. Four coats of waterproofing and three layers of burlap were used, the joints overlapping so the membrane was solid over the whole floor.

Track Supports under Train Shed Floor.

Upon the fourth coat of waterproofing was placed a layer of sand mastic 1½ in. thick, to protect the membrane from damage. In preparing this mastic the waterproofing was heated in open wood fired kettles to a temperature of 400 deg. Fah. and dry hot sand was added, the mixture being then heated to 450 deg. Fah. and constantly stirred to prevent stick-

ing to the sides of the kettles, which would have resulted in burning and ruining the material.

The mastic was composed of one part of Sarco waterproofing and four parts of clean well graded sand. Iron wheelbarrows were used to convey the hot mastic from the place of preparation to the slab on which it was placed. A layer of mastic was laid to a thickness of ¾-in., screeds of this thickness preserving the depth. After compacting it enough to eliminate voids and holes a second course was laid, the joints overlapping the joints in the lower course 12 in. The top course was swabbed with hot Sarco waterproofing which was then sanded before it cooled, to prevent damage by pedestrians. Temporary tracks were laid for the use of trains carrying materials into the terminal and these tracks were shifted as required, a 2-in. cushion of sand being placed over the mastic to prevent injury to it by ties when the waterproofing was carried to a point that required the shifting of the tracks over the completed work. Drainage was provided for and great pains were taken with all the details of the waterproofing.

The entrance is on the north side of Madison street, the magnificent colonnaded entrance having a height of 140 ft., the clock dials facing the three streets being 12 ft. in diameter. On the ground floor at the left of the entrance, Fig. 17, is a news stand with a well equipped lunch room behind it, and a drug store adjoining. Beside the drug store is a vestibule with stairs to the concourse above and adjoining a carriage entrance which is intended to be used for private occasions, such as the reception or departure of distinguished visitors, or for funerals. To the right of the entrance is the ticket office and information bureau with a vestibuled entrance from Canal street. Directly facing the entrance, under the stairs to the concourse, are telegraph offices, behind which is a public space in front of the baggage room where is handled all the incoming baggage, elevators bringing the trunks and other baggage down from the train above. The baggage room opens on a driveway, leading in from Clinton street parallel with Washington street and connecting by means of a gate with a carriage entrance on the Canal street side, stairs leading from the carriage entrance to the concourse, and an entrance leading also to the baggage room. A parcel check room is conveniently located at the east end of the baggage room. At the west end are the offices of the baggage master and clerks.

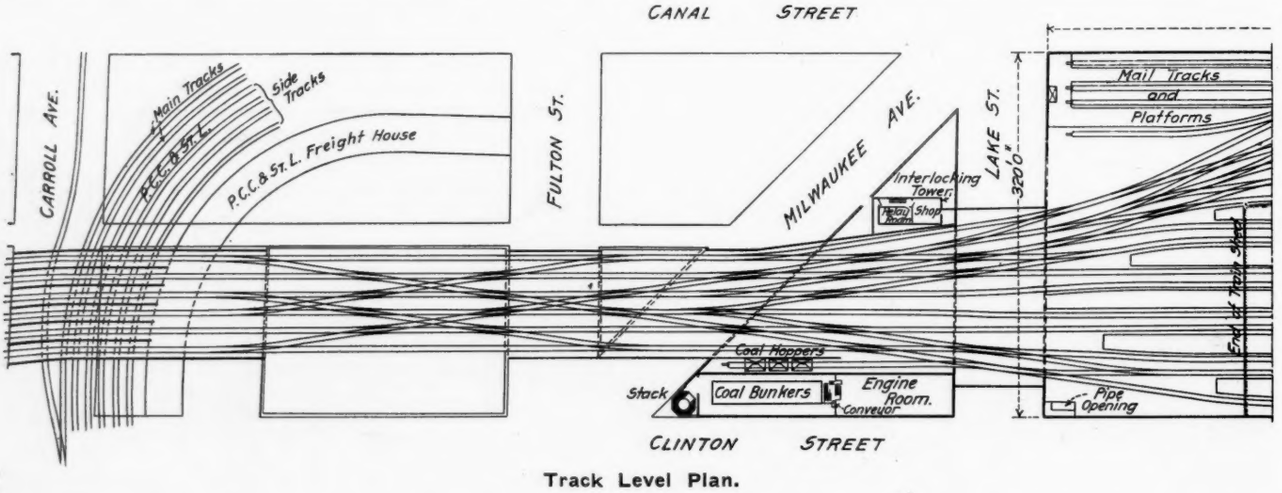
The street car tunnel under the river on Washington street comes to the street surface within the walls of the terminal, with space on each side between the curbs for wagons to use the street. On the north side of Washington street are located the United States Post Office sub-station and distributing tables for the mail brought in on the trains and carried by conveyors from the mail cars to chutes ending above these tables. The post office sub-station is connected with other parts of the station by pneumatic tubes, of which there is a number for the use of the baggage master as well as for the mail service. The suburban concourse is on the north side of the post office sub-station, eight stairways leading from the train floor from the 16 tracks. On the Clinton street end is a room for emigrants who have to remain over between trains, toilet accommodations being provided for men and women, the quarters for the women containing bath rooms. A lunch room with kitchen is provided for emigrant travelers. On the Canal street side is a large space for cabs and automobiles. On the north side of Randolph street is located the out-baggage room

New Chicago Station; Chicago & North Western.

View looking northeast from Clinton street.

and the rooms for the railway mail, conductors, swing room, mail room and express room. There is a trucking space next the street with elevators leading from it to the floor above to take outgoing baggage to the train floor. The power plant, as already mentioned, is on the north side of Lake street.

The main waiting room on the second floor, Fig. 3, is 202 ft. long and 117 ft. wide. On the Canal street end are the men's rooms, and on the Clinton street end is the rest room for women and a dining room 79 ft. x 59 ft. Above these rooms are club rooms for the convenience of passengers who are compelled to wait some hours for trains and who do not wish to leave the building. Every convenience found in the best equipped clubs will be provided here. The concourse is of steel and glass, as well built in as any part of the building, so that no discomfort will be experienced by travelers waiting for trains. The concourse is 60 ft. wide and 320 ft. long.



Track Level Plan.

The elevators, ending in the baggage room on the ground floor, are at the ends of the tracks, just outside the concourse. The three tracks on the Clinton street side and the five tracks on the Canal street side will be used for through trains. Between these latter tracks are mail conveyors consisting of traveling belts flush with the floor and ending over the distributing tables on the floor below in the post office substation. When the trains come in the mail is thrown from the mail cars on to the conveyors and it requires no further attention. Baggage is taken from the opposite side of the trains and there is no interference by the baggage men with mail handling. Incoming baggage is handled by trucks to the elevators at the ends of the tracks near the concourse. Outgoing baggage is taken to the train floor on the north side of Randolph street by elevators and trucked to the baggage room; outgoing mail going up the same way.

The power plant is located at the intersection of Milwaukee avenue and Lake street, and a general arrangement of the boilers, engines and generators, pumps, etc., is shown in the ground plan, Fig. 9.

The boiler plant consists of six Babcock & Wilcox water tube boilers of the vertical header type, all wrought steel construction and designed for a working pressure of 200 lbs. These boilers are set two in a battery, and an unusual method of setting is adopted. The boilers are fired from what is ordinarily termed the rear end, and a combination of horizontal and vertical passes for the gases is arranged so that the up-take is at the top and at the stoker end. Each boiler contains 5,080 sq. ft. of heating surface and is equipped with superheaters of the Foster type, each superheater containing sufficient surface to raise the temperature of 22,000 lbs. of steam per hour 70 deg. Fahr. above that due to a pressure of 155 lbs. by gage.

The boilers are provided with Green traveling grates, each having 98 sq. ft. of active surface, with stokers, and are operated from engine-driven shaft in the basement. A complete system of coal and ash handling apparatus, Fig. 10, was installed by the Link Belt Co., Chicago. It consists of a pan conveyor, taking coal as delivered from the coal hoppers beneath the cars and passing it to the crusher, where it is dropped to a transverse conveyor which delivers it to a Peck continuous pivoted bucket conveyor. This latter elevates the coal to the storage bunkers above the boiler. The ashes are collected in pits below the boilers and raked into pivoted bucket conveyor in the basement; are there elevated to the top of the boiler house, then dropped through a chute to an inclined pan conveyor, which delivers them to the ash storage bin located above the coal car track. Gates are provided in the bottom of this bin to deliver ashes to cars on the track. Sprague electric motors are used for all drives throughout.

It will be seen that the conveyors are arranged so that a coal car is emptied and the coal distributed to the boiler, while the ashes are elevated and delivered to the same car in the same position.

The large chimney rests on a concrete foundation which extends 20 ft. below the base and is supported on four concrete cylinder piers, and the smoke connection from the chimney back into the boiler room is constructed of reinforced concrete lined with fire brick. The breeching opening into the chimney is 6 ft. 6 in. wide x 15 ft. high. The inside diameter of the chimney at the base is 11 ft. and the top 10 ft. 6 in. It stands on an octagonal base, above which is a circular stack built of Custodis radial brick rising to a height of 245 ft. above the boiler room floor. It is surmounted with a cast iron cap, on which are bronze fasteners supporting the four lightning rods, which are 6 ft. high and furnished with 24 platinum points.

There are three vertical cross-compound non-condensing Corliss engines, built by the Allis-Chalmers Co., with cylinders 25 in. and 44 in. x 42 in., each rated at 1,150 h.p. at 100 revolutions per minute, steam pressure 150 lbs. The receiver on these engines is equipped with reheating coils. The dynamos are direct-connected 250 volt, continuous current, compound wound, machines of 750 k. w. capacity, manufactured by the General Electric Co. There are two motor generator sets, each comprising 250-volt d.c. motor, 720 rev. per min., driving a 500-k.w. 6 600-volt a.c., 60-cycle, 3-phase alternating curent generator. Each machine has its own direct-connected exciter unit. There is also a low pressure steam turbine and generator unit of 500 k.w. capacity, the generator end a 250-volt d.c. machine, operated in multiple with the engine-driven dynamos. This turbine is of the horizontal type, running at 1,500 revolutions per minute, with the dynamo mounted on the turbine shaft. Steam will be supplied directly from the main engine exhaust at a pressure

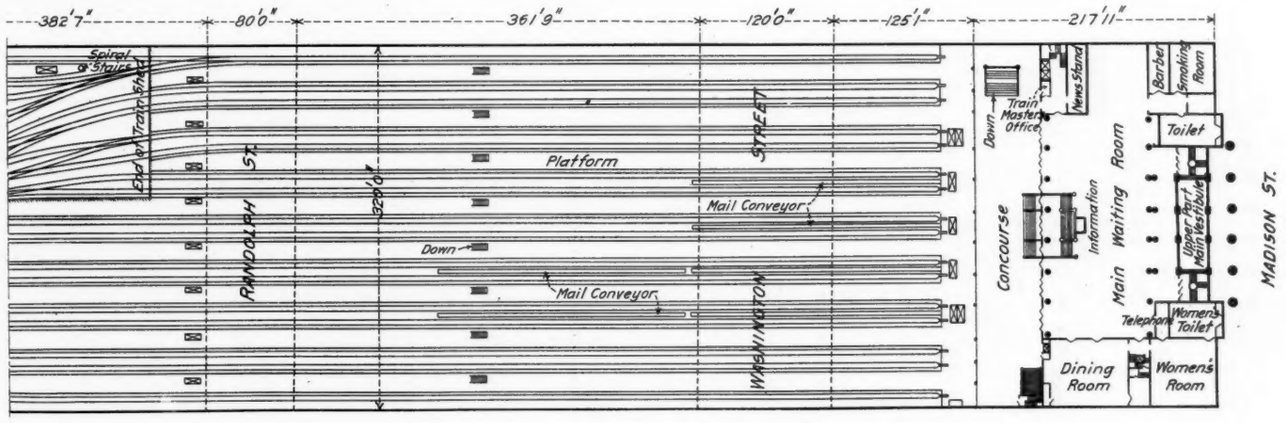
of 16 lbs. absolute, the turbine operating under a vacuum of 27 in. In connection with the low pressure steam turbine there is installed a Worthington surface condenser, containing 4,000 sq. ft of tube surface, together with the usual auxiliary equipment of dry vacuum air pump, hot well and circulating pumps. The latter are motor-driven centrifugal pumps fitted with bronze runners and shafts.

A cooling tower is erected on the roof of the boiler house. This is of the four-fan type, with two fans on a shaft, each shaft driven by a Sprague motor. Above the fans the tower is encased in brick work. The complete equipment is designed to cool and circulate sufficient water to condense 22,500 lbs. of steam per minute and maintain at the turbine exhaust a vacuum of 27 in.

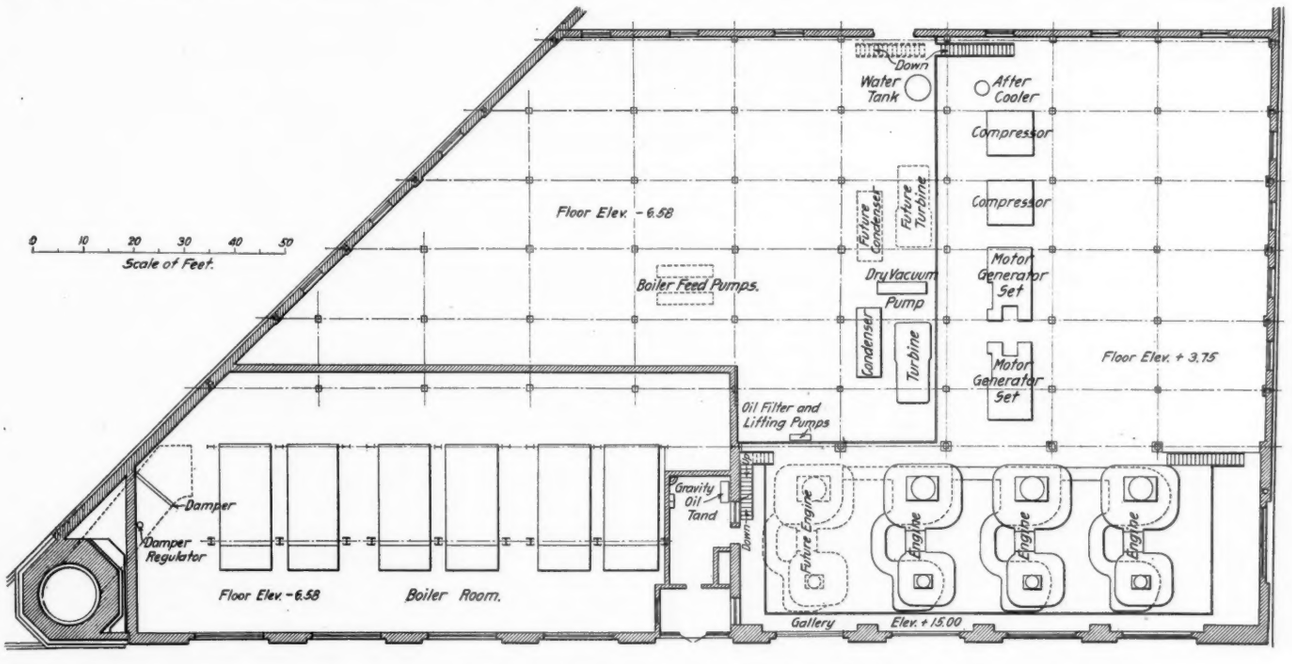
For boiler feed there is provided two Epping-Carpenter outside, center-packed plunger pumps, duplex and compound, with 8-in. and 12-in. by 7-in. by 12-in. cylinders. To care for the heating system provided for the power house and interlocking tower adjacent, there has been installed in duplicate 6-in. x 8-in. Marsh vacuum pumps, for removing all condensation and delivering it to the feed water heater. The feed water heater is of the Webster type, 3,000 h.p., with a capacity for heating 90,000 lbs. of water from 60 deg. Fahr. to 204 deg. Fahr. per hour. For draining the sub-basement below the boiler room there will be installed a Yeomans electric bilge pump. That portion of the power house below the sewers will be cared for by a Shone ejector.

In the engine room are also two Ingersoll-Rand air compressors. These are cross-compound, steam-driven, two-stage air compressors, each with a capacity of 500 cu. ft. The steam cylinders are 11 in. and 18 in. and the air cylinders 6 in. and 10 in., all 14-in. stroke. Each machine is equipped with intercooler and the system is provided with an aftercooler, through which all of the air will pass before being delivered to the transmission lines to insure its freedom from moisture.

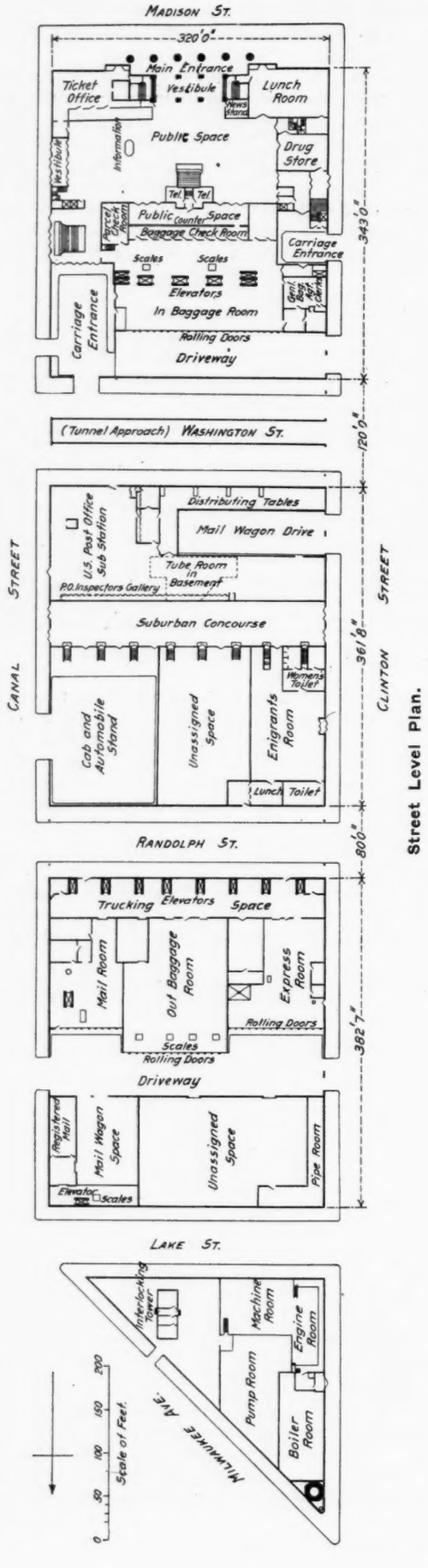
At the station building there is an auxiliary boiler plant consisting of two B. & W. boilers of the same type as those at the power house, but containing only 1,500 sq. ft. of heating surface each. These boilers are set with twin-fire furnaces, as built by the Water Arch Furnace Co. There is also at the station building a machinery room, where there are various service pumps, a fire pump, water heater for domestic supply, garbage destructor for the refuse from the kitchen and restaurants, machinery for vacuum cleaning system of the main building, also air pumps and tanks, of the Johnson Service Co. temperature regulating system. This vacuum sweeping system will care for the entire terminal station building, while a second plant under the track structure will serve the emigrants'



Track Level Plan (Continued).



Power House; Chicago & North Western Station.

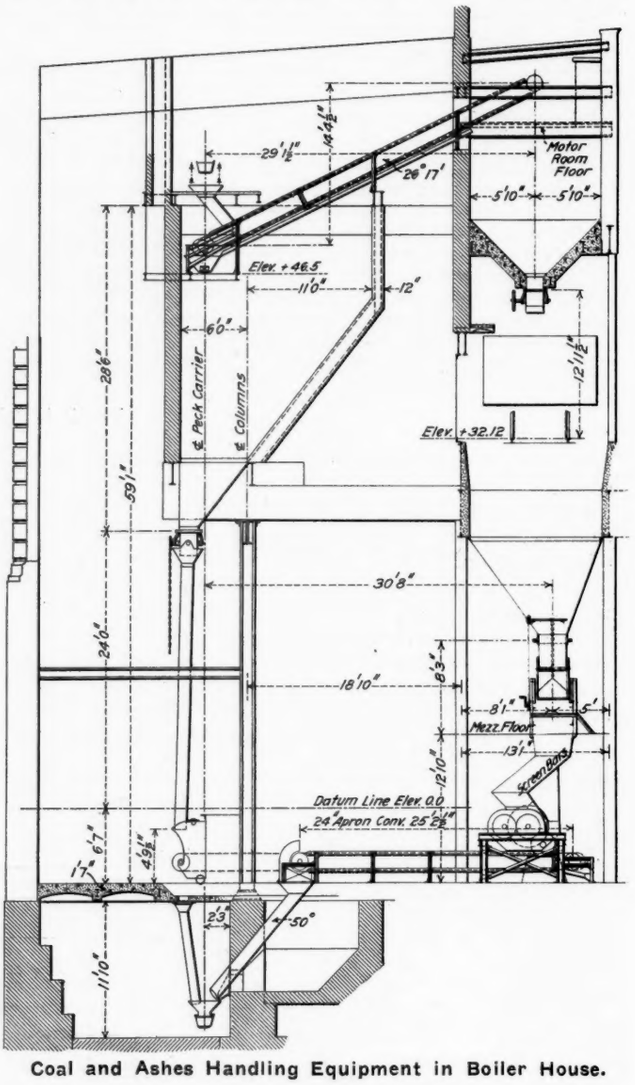


Street Level Plan.

quarters, and the suburban concourse and the space devoted to the United States post office.

There is also installed at the main station building a Carbondale Machine Company's absorption system of refrigeration, with a capacity of 50 tons. This cools water for drinking purposes, the water being pumped through the building, also by a separate system to the power house, which is about 1,800 ft. north of the plant. The refrigerators and cooling boxes are of 6,000 cu. ft. capacity, for use in connection with the restaurant kitchens, which are also cared for by this refrigerating plant.

W. C. Armstrong, Terminal Engineer for the Chicago & North Western, has been in charge of the preparation of the plans and of all the construction work. The architects are



Coal and Ashes Handling Equipment in Boiler House.

Frost & Granger, of Chicago, and Pierce, Richardson & Neilor are the engineers for the power plant and equipment. The George A. Fuller Construction Company had the general contract for the building, exclusive of track structures and train shed. The steel work was fabricated by the American Bridge Company and erected by the Stroebel Steel Construction Company. George W. Jackson, Inc., had the contract for foundations and concrete on the Terminal section. John J. O'Heron & Company had the contract for the west approach and the Bates & Rogers Construction Company the contract for the north approach, these involving several thousand feet of retaining walls of varying heights up to 26 ft. Gustavino arches are used in all ceilings in the main building and the interior finish was supplied by the American Marble Company.

General News Section.

The Chicago, Indianapolis & Louisville has increased the pay of trainmen and yardmen.

The Yazoo & Mississippi Valley now has train auditors to collect fares on its passenger trains.

In a derailment on the Trans-Caspian Railway, July 11, near Kisilawat, 19 persons were killed and 31 injured.

The Seaboard Air Line has made an increase of 3½ cents an hour in the pay of the men in its shops who belong to the Federation of Trades.

A board of conciliation, which has been sitting at Toronto, Ont., has awarded a large increase in pay to the telegraphers of the Grand Trunk Pacific.

The locomotive engineers on 49 railways west of Chicago are formulating demands for increases in wages, which it is expected will be presented to the officers of the railways before August 1.

At Austin, Tex., it is said that Governor Campbell will recommend to the legislature at its special session in August that it authorize the sale of the Texas State Railroad, running between Rusk and Palestine, about 40 miles. The road has been operated at a loss ever since it was built.

On the line of the Delaware & Hudson, between Wilkesbarre and Carbondale, Pa., last week, disturbances perpetrated by the striking track laborers were so extensive and persistent that the company ordered the discontinuance of all night freight trains. Several freight trains had been derailed. Twenty-three freight-train crews were laid off.

Passenger train, No. 3, of the Missouri, Kansas & Texas, was stopped on the night of July 9 about 12 miles from St. Louis by three robbers, who intimidated the engineman and compelled him and the fireman to present their demands on the express messenger; but it appears that the robbers were frightened away before they had got anything of value.

According to the *Galveston News,* the Southern Pacific now employs "train auditors" on local freight trains. It seems that these men are not employed for the purpose of collecting fares of the passengers who ride on the local freights, but to keep close track of the package freight left at and taken from the way stations. It is said that much freight has been lost or stolen.

The Pennsylvania has laid off 400 shop men at Altoona and 26 freight crews on the middle division. The freight yard at Hollidaysburg and its shops have been closed, the falling off in freight being such that the whole of the business can be handled at the Altoona yards. The Philadelphia & Reading has reduced the time in its locomotive shops at Reading from 40 hours a week to 32 hours.

The Twentieth Century Limited express trains of the New York Central will soon all be composed entirely of steel cars; five complete trains of cars for this service being now under construction at the shops of the Pullman Company. In each of the new trains there will be a bath room with a shower bath attachment, and the smoking cars will be provided with exhaust fans.

President Taft has appointed as members of the Congressional Commission, which is to investigate the question of employers' liability and workmen's compensation, Messrs. W. C. Brown, president of the New York Central, and D. L. Cease, editor of the "Railroad Trainman." The other members of the commission are: Senators Hughes, of Colorado, and Warner, of Missouri; and Representatives Denby, of Michigan, and Brantley, of Georgia.

The Bureau of Statistics and Accounts of the Interstate Commerce Commission has issued a revised classification of expenditures for additions and betterments on steam railways, taking effect July 1. The original issue of this classification was issued June 21, 1909, and the present pamphlet, called "The First Revised Issue," has been prepared to meet such criticisms as have been presented and favorably acted on. The most prominent change is a clause, giving railways the option of charging betterments to operating expenses, where the total amount is less than $200 for any one improvement. A new account has been added, A22, "Roadway Machinery and Tools," and the last primary account, No. A35, covering miscellaneous items, has been amplified. Under the head of "Equipment," (A33), it is provided that when equipment is practically rebuilt the reserve for accrued depreciation shall be adjusted and the basis for the depreciation on such equipment amended to meet the changed conditions. In making an estimate of a proper rate to be applied for depreciation on equipment, it will be necessary to consider only its probable life in service as prolonged by usual repairs.

The Southern Pacific lines east of El Paso, following protracted negotiations under the guidance of the government mediators, have made a small increase in the pay of telegraphers. The operators asked for an increase of about 7½ per cent., together with some modification of the hours of work; but, according to the newspapers, the increase granted is very small, while the hours of work, so far as Texas is concerned, will be regulated by the state law.

Riding in the London Tubes.

Oh, what an improvement on that awful steam underground of 10 years or less ago! Where the smoke was so choking that you lost consciousness between stations and where it was too black to read the names of the stations. The present system is centuries ahead of the other, and if you know just where you want to change and you don't mind walking half the way, there isn't a better or quicker way of getting about London except a taxi. The crowds at rush hours behave differently from New York crowds. The train comes quickly in, the guard steps out and in a courteous tone asks you to hurry, but there is little inclination to shove on the part of the passengers. They make way for each other while the precious moments pass. At last they are all on board and nothing remains but the exercise of the guard. Probably the motormen run the train slowly so that the guard may come to no injury in his attempt to board the train; but after he is on board there is just as much speed as on a subway express. You have the privilege in some cars on most trains of smoking among the ladies; and there are maps of the system in the car so that you may have some idea of the number of roads there are and how easy it will be for you to make a mistake and run miles out of your course. You cannot leave the underground until you have produced the right ticket; not unless you happen to have a penny about you.—*The Sun,* New York.

Rock Island Machinists' Strike.

About half the machinists on the Chicago, Rock Island & Pacific struck on Monday, July 11. The road had shut down its shops for a short time early in June. At that time the business agent representing the employees gave instructions that no machinists do any work in the shops while they were closed. The management of the road knew nothing of these instructions. A short time afterward, five men in the shops at Chickasha, Okla., were ordered to do certain work, and they refused. The management gave orders that when the shops re-opened, on July 5, these men should not be employed. On July 6 all the machinists at the Chickasha shops walked out, and the business agent notified the railway that if the five men in question were not re-employed he would call out all the 700 machinists on the road. W. S. Tinsman, general manager, was away from his office at that time. W. A. Nettleton, general superintendent of motive power, asked that action be postponed until he could confer with Mr. Tinsman. The business agent refused, and ordered the strike Monday morning.

Curiously enough, most of the men in the shops in the Southwest stayed at work, while those at Silvis, and other towns in Illinois, went out. This is probably due to the fact that the business agent lives at Davenport, Iowa. The strike has caused

no serious trouble, as the road's equipment is in good shape and it is receiving new engines. The men at Chickasha, where the trouble originated, went back to work on Wednesday, which makes it probable that the strike will soon fall through.

Aeroplane Records.

At Rheims, France, July 7, Mr. Olieslager flew in the air continuously for 2 hours, 39 minutes, 39 seconds, traversing in that time 158.35 miles. This is the longest time that a heavier-than-air flying machine has yet remained aloft. On July 10, Olieslager flew 244.44 miles in 5 hours, 3 minutes, 5 seconds; nothing said in the despatches about stops. On the same day, Leon Morane flew five kilometers (3.1 miles) in 2 minutes, 53 seconds, and 10 kilometers in 5 minutes, 42 seconds. Morane also took the prize for speed, flying 20 kilometers (12.44 miles) in 12 minutes, 45 seconds. In a later flight the same day, he made five kilometers in 2 minutes, 48 seconds; equal to 68.42 miles an hour. All of these records were made with monoplanes.

A Correction.

An officer of the Delaware & Hudson Company writes to say that in the map of Pennsylvania, published in our issue of June 24, page 1794, that part of the Delaware & Hudson line between Carbondale and Scranton, 16 miles, should be shown as a four-track road. On the map it was shown as two-track.

Opening of Long Island Railroad to Manhattan Island.

The Long Island Railroad announces that its trains will be run regularly through the East river tunnels to the new station at Seventh avenue, Manhattan, beginning on Thursday, September 8.

American Society for Testing Materials.

At the thirteenth annual meeting of the society held at Atlantic City, N. J., June 28 to July 2, a number of amendments to the by-laws, proposed by the executive committee, were referred to letter ballot of the society.

Article 1, referring to membership and dues, was altered to the following effect: The membership of the society shall consist of members and junior members. A member shall be a person not less than 30 years of age, corporation, firm, technical society, teaching faculty or library, proposed by two members and approved by the executive committee. A junior member shall be a person less than 30 years of age, proposed by two members and approved by the executive committee. A junior member shall have the same rights and privileges as a member, and his status shall be changed to that of member at the beginning of the fiscal year next succeeding the date on which he attains the age of 30 years.

Article 2, regarding the executive committee, was changed to include these officers and also the last past president and seven members, four being elected by letter ballot at each annual meeting in the odd years, and three at each annual meeting of the even years. Four members of the executive committee shall constitute a quorum.

The total membership on June 15, 1910, was 1,280. Sixty-one additional applications for membership have been approved since that date, making a total of 1,341, as against 1,160 as reported at the previous annual meeting.

International Railway Congress.

The International Railway Congress was opened at Berne, Switzerland, last week, according to the program. The number of delegates and visitors was larger than had been expected, and all of the sight-seeing excursions were crowded. At a dinner of the English speaking delegates, on the evening of July 11, Interstate Commerce Commissioner F. K. Lane made one of the principal speeches. Mr. Lane called attention to the fact that American laws, regulating railway charges, were not nearly so radical as those of Great Britain. He declared that all candid railway men acknowledge that the law which has just been passed by the United States Congress will tend to the stability of securities.

MEETINGS AND CONVENTIONS.

The following list gives names of secretaries, dates of next or regular meetings, and places of meeting.

Air Brake Association.—F. M. Nellis, 53 State St., Boston, Mass.
American Association of Demurrage Officers.—A. G. Thomason, Scranton, Pa.
American Association of General Passenger and Ticket Agents.—C. M. Burt, Boston, Mass.; next meeting, St. Paul, Minn.
American Assoc. of Local Freight Agents' Ass'n.—G. W. Dennison, Penna. Co., Toledo, Ohio.
American Ass'n of Railroad Superintendents.—O. G. Fetter, Carew Bldg., Cincinnati, Ohio.
American Railway Association.—W. F. Allen, 24 Park Place, New York.
American Railway Bridge and Building Association.—C. A. Lichty, C. & N. W., Chicago; Oct. 18; Fort Worth, Tex.
American Railway Engineering and Maint. of Way Ass'n.—E. H. Fritch, Monadnock Bldg., Chicago
American Railway Industrial Association.—G. L. Stewart, St. L. S. W. Ry., St. Louis.
American Railway Master Mechanics' Association.—J. W. Taylor, Old Colony Building, Chicago.
American Railway Tool Foremen's Association.—O. T. Harroun, Bloomington, Ill.
American Society for Testing Materials.—Prof. Edgar Marburg, Univ. of Pa., Philadelphia.
American Society of Civil Engineers.—C. W. Hunt, 220 W. 57th St., N. Y.; 1st and 3d Wed., except July and August; New York.
American Society of Mechanical Engineers.—Calvin W. Rice, 29 W. 29th St., N. Y.; 2d Tues.; New York.
American Street and Interurban Railway Ass'n.—H. C. Donecker, 29 W. 39th St., New York; Oct. 10-14; Atlantic City.
Association of Am. Ry. Accounting Officers.—C. G. Phillips, 148 Dearborn St., Chicago.
Association of Railway Claim Agents.—E. H. Hemus, A., T. & S. F., Topeka, Kan.
Association of Railway Telegraph Supfrintendents.—P. W. Drew, 135 Adams St., Chicago; June 19, 1911; Boston.
Association of Transportation and Car Accounting Officers.—G. P. Conard, 24 Park Pl., New York.
Buffalo Transportation Club.—J. N. Sells, Buffalo.
Canadian Railway Club.—James Powell, Grand Trunk Ry., Montreal, Que.; 1st Tues. in month, except June, July and Aug..; Montreal.
Canadian Society of Civil Engineers.—Clement H. McLeod, Montreal, Que.; Thursdays; Montreal.
Car Foreman's Association of Chicago.—Aaron Kline, 841 North 50th Court, Chicago; 2d Monday in month; Chicago.
Central Railway Club.—H. D. Vought, 95 Liberty St., New York; 2d Friday in January, March, May, Sept. and Nov.; Buffalo.
Engineers' Society of Pennsylvania.—E. R. Dasher, Box 704, Harrisburg, Pa.
Engineers' Society of Western Pennsylvania.—E. K. Hiles, 803 Fulton Building, Pittsburgh; 1st and 3d Tuesdays; Pittsburgh.
Freight Claim Association.—Warren P. Taylor, Rich., Fred. & Pot. R.R., Richmond, Va.
General Superintendents' Ass'n of Chicago.—H. D. Judson, 209 Adams St., Chicago; Wednesday preceding 3d Thurs.; Chicago.
International Master Boiler Makers' Association.—Harry D. Vought, 95 Liberty St., New York.
International Railway Fuel Association.—D. B. Sebastian, La Salle St. Station, Chicago.
International Railway General Foremen's Association.—L. H. Bryan, D. & I. R. Ry., Two Harbors, Minn.
International Railway Master Blacksmiths' Ass'n.—A. L. Woodworth, Lima, Ohio; Aug. 16-18; Detroit, Mich.
International Railway Congress.—Executive Committee, rue de Louvain, 11, Brussels; July 4-16; Berne, Switzerland.
Iowa Railway Club.—W. B. Harrison, Union Station, Des Moines, Ia.; 2d Friday in month, except July and August; Des Moines.
Master Car Builders' Association.—J. W. Taylor, Old Colony Bldg., Chicago.
New England Railroad Club.—G. H. Frazier, 10 Oliver St., Boston, Mass.; 2d Tues. in month. ex. June, July, Aug. and Sept.; Boston.
New York Railroad Club.—H. D. Vought, 95 Liberty St., New York; 3d Friday in month, except June, July and August; New York.
North-West Railway Club.—T. W. Flanagan, Soo Line, Minn.; 1st Tues. after 2d Mon., ex. June, July, August; St. Paul and Minn.
Northern Railway Club.—C. L. Kennedy, C., M. & St. P., Duluth; 4th Saturday; Duluth, Minn.
Omaha Railway Club.—A. H. Christiansen, Barker Blk.; 2d Wed.
Railway Club of Kansas City.—C. Manlove, 1008 Walnut St., Kansas City; Third Friday in month; Kansas City.
Railway Club of Pittsburgh.—J. D. Conway, Pittsburgh, Pa.; 4th Friday in month, except June, July and August; Pittsburgh.
Railway Signal Association.—C. C. Rosenberg, 12 North Linden St., Bethlehem, Pa.; annual, Oct. 11; Richmond, Va.
Railway S'keepers Ass'n.—J. P. Murphy, Box C., Collinwood, O.
Richmond Railroad Club.—F. O. Robinson; 2d Monday; Richmond.
Roadmasters' and Maintenance of Way Ass'n.—Walter E. Emery, P. & P. U. Ry., Peoria, Ill.; annual, Sept. 13-16; Chicago.
St. Louis Railway Club.—B. W. Frauenthal, Union Station, St. Louis, Mo.; 2d Friday in month, except June, July and Aug.; St. Louis.
Society of Ry. Financial Officers.—C. Nyquist, La Salle St. Station, Chicago; Oct. 25 and 26; Hotel Chamberlin, Old Point Comfort, Va.
Southern Association of Car Service Officers.—E. W. Sandwich, A. & W. R. Ry., Montgomery., Ala.; annual, Oct. 20; Atlanta.
Southern & Southwestern R.R. Club.—A. J. Merrill, Prudential Bldg., Atlanta; 3d Thurs., Jan., Mar., July, Sept. and Nov.; Atlanta.
Traffic Club of New York.—C. A. Swope, 290 Broadway, New York; last Tuesday in month, except June, July and August; New York.
Train Despatchers' Ass'n of America.—J. F. Mackie, 7042 Stewart Ave., Chicago.
Transportation Club of Toledo.—L. G. Macomber, Woolsen Spice Co., Toledo.
Traveling Engineers' Association.—W. O. Thompson, N. Y. C. & H. R., East Buffalo; annual meeting; Aug. 16-19; Niagara Falls, Ont.
Western Canada Railway Club.—W. H. Rosevear, P. O. Box 1707, Winnipeg; 2d Monday, except June, July and August; Winnipeg.
Western Society of Engineers.—J. H. Warder, Monadnock Bldg., Chicago; Wednesdays, except July and August; Chicago.

Traffic News.

The railways of the southern states are preparing new freight tariffs, showing increases in rates, which will be ready for publication, it is said, in about six weeks.

The British steamer Inverkip has been chartered to bring to California a cargo of coal from Chinwangtao, China. The mines at this place have just been opened to foreign trade.

The shipments of anthracite coal in the month of June amounted to 5,398,123 tons, equal to about 10 per cent. more than the shipments in June, 1909. All of the roads show increases except the Erie, on which there was a decrease of 12 per cent.

A reduction of $25 a car has been made in the freight rate on fruit from towns in Georgia to interior points of New York and Pennsylvania. It is said that this rate was made after an informal conference and agreement between the traffic officers of the roads interested and the fruit shippers.

During the last five days of June, the number of new tariffs filed with the Interstate Commerce Commission was over 11,000. Some of these tariffs named 500 carriers as participants in the rates, from which it would appear that if the commission decides to suspend the advanced rates proposed by these tariffs, it will have a considerable clerical task on hand.

The St. Louis lines, at the request of Commissioner Coyle, of the Traffic Bureau of the Business Men's League of St. Louis, have appointed a committee to confer with the board of managers of the Traffic Bureau from time to time on eastbound rate matters. The committee appointed by the roads is composed of W. C. Maxwell (Wabash), C. L. Hilleary (New York Central Lines) and G. W. Davis (Vandalia).

The state's attorney of Montgomery county, Illinois, has brought suit at Champaign against the Illinois Traction System, an electric line, for alleged violation of the state 2-cent fare law. He contends that this road in advancing its fare from Mt. Olive to Litchfield, eight miles, to 80 cents has fixed a rate that is illegal. The rate in question is 4 cents more than that charged by the Illinois Central and the Wabash.

San Diego, Cal., gets its supply of lumber largely from Puget Sound forests in the shape of giant rafts, towed by tugs. Half a dozen of these will traverse the 1,500 miles of ocean during the summer. On June 21st the first raft of the season, containing over 7,000,000 ft. of logs, bound with 31 tons of chain, arrived in San Diego bay in tow of the tug Hercules. The raft was cigar shaped and measured over 500 ft. in length. It drew 20 ft. of water.

W. M. Hopkins, transportation manager of the Chicago board of trade, has issued a circular warning members of the board against manipulation of the transit privilege resulting in violations of the integrity of the published rates. Members of the Interstate Commerce Commission have indicated to the board of trade that it is the commission's intention to stop manipulation of the rates on grain through abuse of the transit privilege, and that if this end cannot be attained otherwise the commission will abolish the transit privilege.

The Lehigh Valley announces that it will soon restore passenger rates in the state of Pennsylvania to the basis which was in effect prior to October 1, 1907, when rates within that state were reduced because of the passage of the 2-cent law. This law was decided unconstitutional, so far as the Pennsylvania Railroad is concerned, many months since, and now a suit of the Philadelphia & Reading has also been decided by the supreme court in favor of the road. Assuming that these two suits settle the main questions concerning the constitutionality of the law, the Lehigh Valley proposes to raise its fares at once. The supreme court, endorsing the lower court, bases its decision on the constitutional provision that the legislature can alter the charter of a railway only in such manner that no injustice shall be done to the incorporators.

L. W. Noyes, president of the Illinois Manufacturers' Association, has telegraphed to President Taft intimating that the agreement as to advances in freight rates made by the President with the presidents of certain railways is not being carried out in the spirit in which it was made. Mr. Noyes directs attention to reports from Washington that the burden of proving that advances are unreasonable is to be put on the shippers and says: "In speaking for the shippers we assure you we wish the carriers treated fairly, but we believe that the advances they are asking are unreasonable and we think that the plan suggested by you that they first show the equity of what they are asking before they put the rates into effect is nothing more than right. Fallacious arguments as to probable financial disaster unless rates are advanced are being put forth to scare the public. Please remember that the thousands and thousands of shippers interested in this matter are scattered, are poorly organized and cannot concentrate their effort quickly and must depend upon you for protection."

I. C. C. Hearing on New York Commutation Rates.

The first hearing under the revised interstate commerce act was held in Washington on Tuesday of this week, when the New Jersey commuters submitted their protest against the raising of season-ticket rates from stations in that state into New York by the Pennsylvania, the Delaware, Lackawanna & Western, the Central of New Jersey, the Erie, the New York Central (West Shore) and the Lehigh Valley. The roads were represented by a formidable array of counsel and traffic officers. The increased rates are advertised to go into effect July 20, and the commuters ask the commission to suspend them for 120 days while a full investigation into their reasonableness is being made. At the close of the hearing Chairman Knapp announced that a decision would be made in three or four days.

The railways denied the jurisdiction of the commission to suspend the proposed increases, on the ground that the new rates were filed before the enactment of the new law; and also maintained that the proposed increases are warranted because expenses have increased greatly. They discussed at length the provision of the new law authorizing the commission to suspend proposed increases, contending that this power should not be used except in extraordinary cases, when it appeared that irreparable injury would be done unless suspensions were ordered. The power to suspend is analogous to that exercised by courts of equity in issuing temporary injunctions. All the roads maintained that they were losing money on suburban passenger traffic from New Jersey points to New York.

George F. Brownell, of the Erie, said that his road had spent $8,000,000 for improvements, including the open cut through Bergen Hill, which, he said, would greatly improve the passenger service. He also said that the increases in wages in 1910 will amount to $1,560,000 a year. The commutation rates are less than one-half the regular rates. The actual cost of hauling a passenger is 1.5 cents a mile. The commutation business does not pay its fair share of conducting the company's business. The commutation rates are unduly low as compared with commutation rates in other parts of the country.

W. H. Truesdale, president of the Delaware, Lackawanna & Western, declared that for the last 10 years his company had operated the Morris & Essex division at a loss of about $1,000,000 a year, while the Lackawanna had spent $15,000,000 on that division in 10 years. The per capita cost of handling commutation traffic had materially increased since the rates were established years ago.

George A. Cullen, general passenger agent of the Lackawanna, said that in most instances the proposed rates were lower than commutation rates on other lines for similar distances. He figured that the general increase in commutation rates by his road would average 15 per cent. He asserted that it cost 47 per cent. more to-day to seat a passenger in a coach than it did 20 years ago.

J. B. Thayer, third vice-president of the Pennsylvania, gave testimony similar to the foregoing.

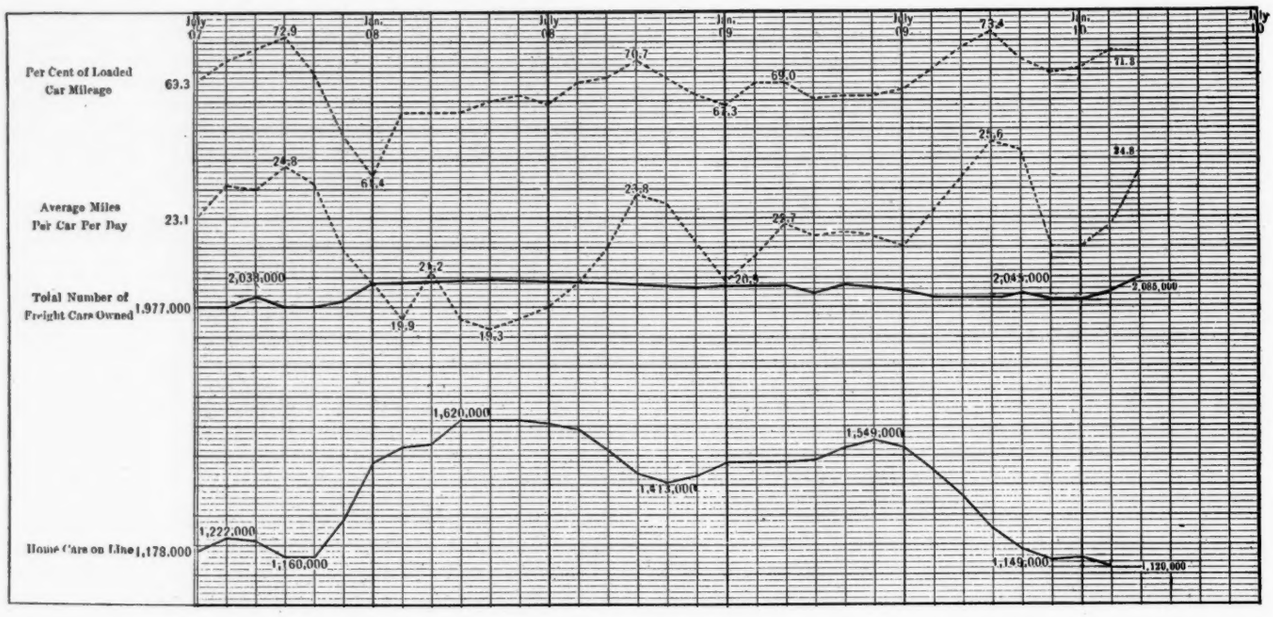
W. C. Hope, general passenger agent of the Central of New Jersey, testified that the commutation rates averaged his company 5.5 mills of a mile. He declared the service was not remunerative.

In presenting elaborate tables on the commutation traffic H. A. Taylor, of the Erie Railroad, said that the Erie's taxes in New Jersey had been increased 151 per cent. in the last 10 years.

Attorney-General Wilson, of New Jersey, urged the commission to suspend the rates in order that the complaining com-

muters might have an opportunity to study the exhibits made by the railways and reply to them. He pointed out that, in his opinion, the law placed the burden of proof on the railways. They must show that conditions justified the increase. They had put in a mass of figures. Whether these were correct and justified the increases could only be determined after the data had been examined. "These increases," he said, "are a menace to the prosperity of many communities. It is an unwarranted hardship on tens of thousands of people who have built and are building homes on the strength of the existing rates."

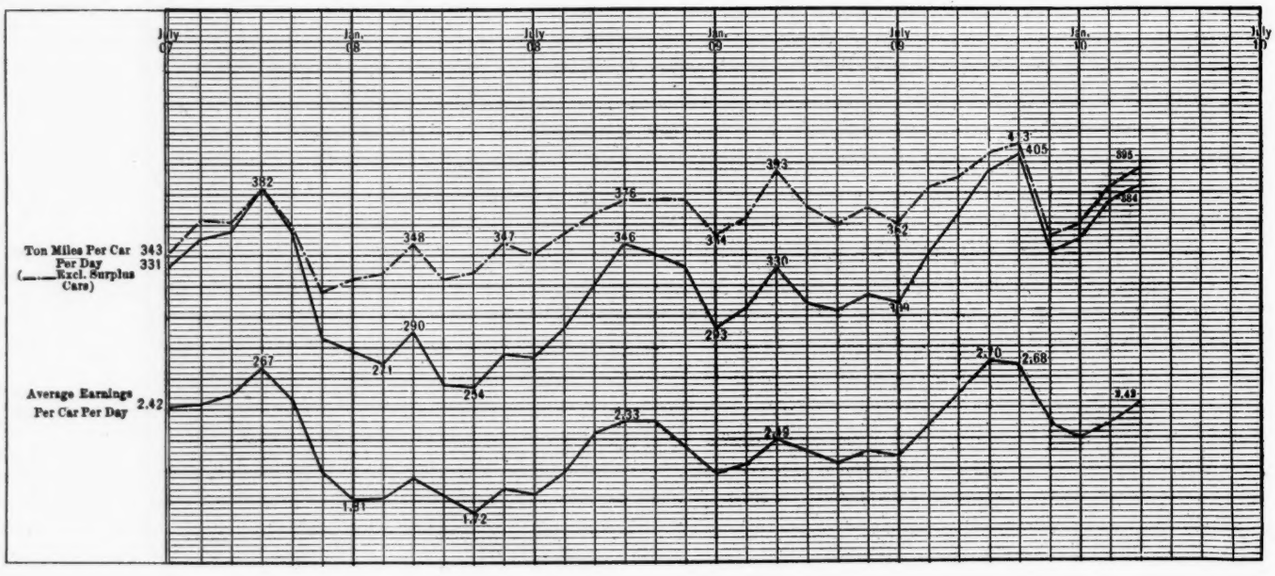
"The opportunity to examine the railways' claims," suggested Chairman Knapp, "would not be lost through the refusal of this commission to suspend the rates. The commission subsequently could entertain complaints of these proposed rates."



Car Balance and Performance.

day averaged 24.8, within .8 of the high figure reached in October, 1909. The ton-miles per car per day reached 384 for all cars, and 395 excluding surplus cars, these figures also being close to the October, 1909, average. The daily earnings per car averaged $2.42.

Notwithstanding the continuation of an outward interchange which resulted in the reduction of the number of cars at home



Car Loading and Earnings.

to 54 per cent., the loaded mileage shows a slight recession, averaging 71.3 per cent. as against 71.4 per cent. in February. The tons per loaded car decreased to 21.6, or 1.1 tons less than the high average for February. The cars in shop were at 5.29 per cent. of the total a slight reduction made February."

The accompanying table gives car balance and performance for the period covered by the report. The charts show graphi-

Freight Car Balance and Performance.

Arthur Hale, chairman of the committee on relations between railways of the American Railway Association, in presenting statistical bulletin No. 76, covering car balance and performance for March, 1910, says:

"Conditions during March were quite favorable to a good car performance and the results attained are quite clearly reflected in the averages shown in this bulletin. The miles per car per

CAR BALANCES AND PERFORMANCES IN MARCH, 1910.

	New England.	N. Y., N. J., Del., Md., Eastern Pa.	Ohio, Ind., Mich., Western Pa.	Va., W. Va., No. and So. Carolina.	Ky., Tenn., Miss., Ala., Ga., Fla.	Iowa, Ill., Wis., Minn.	Mont., Wyo., Neb., Dakotas.	Kan., Colo., Okla., Mo., Ark.	Texas, La., New Mex.	Ore., Idaho, Nev., Cal., Ariz.	Canadian Lines.	Total.
Revenue freight cars owned	76,677	665,900	220,206	169,459	174,256	385,161	16,805	135,339	22,691	117,761	100,736	2,084,991
Average number of system cars on line	37,938	334,419	109,897	91,753	82,954	248,109	5,714	73,658	15,613	59,122	60,999	1,120,176
Railway-owned cars: Average foreign on line	41,867	284,789	103,877	65,000	72,306	224,924	15,023	62,580	14,448	58,605	27,357	971,276
Total cars on line	79,805	619,208	213,774	156,753	155,260	473,033	20,737	136,238	30,061	117,727	88,856	2,091,452
Excess	3,128	.....	.....	.....	.....	87,872	3,932	899	7,370	.....	.....	.....
Per cent. of cars on line to total owned:												
Home	49	50	50	54	48	65	34	55	69	50	60	54
Foreign	55	43	47	39	41	58	89	46	63	50	28	46
All railways	104	93	97	90	89	123	123	101	132	100	88	100
Private cars on line	3,281	39,303	10,334	4,164	6,826	17,183	1,370	7,444	2,087	8,909	2,708	103,609
Total, all cars on line	83,086	658,511	224,108	160,917	162,086	490,216	22,107	143,682	32,148	126,636	91,564	2,195,061
Per cent. of cars in shop	4.15	4.95	5.50	5.66	7.02	4.08	4.52	9.57	5.06	5.08	5.17	5.29
No. of freight engines owned	1,234	9,894	2,855	2,949	2,581	6,073	449	2,620	681	2,333	2,126	33,795
Average cars on line per freight engine owned	67	67	78	55	63	81	49	55	47	54	43	65
Total freight-car mileage	47,437,948	532,793,696	165,977,640	126,595,439	128,960,258	315,125,450	24,203,777	101,247,845	28,671,920	120,426,383	87,297,991	1,678,728,347
Average miles per car per day	18.4	26.1	23.9	25.4	25.7	20.9	35.3	23.9	28.8	30.7	30.8	24.8
Per cent. loaded mileage	74.8	68.8	71.5	73.9	73.5	77.3	70.1	68.6	70.6	81.4	71.3	
Ton-miles of freight, including Company freight	524,458,926	8,685,690,635	2,441,152,284	2,091,272,869	1,969,759,457	3,697,128,484	393,854,995	1,492,386,272	364,880,305	1,784,590,160	1,254,888,085	24,630,012,472
Average ton-miles, including Company freight:												
Per car-mile	11.1	16.3	16.1	16.5	15.4	14.2	16.9	14.7	12.7	15.1	14.4	15.5
Per loaded car-mile	14.8	23.7	22.5	24.6	19.3	19.8	21.8	21.2	18.6	21.4	17.7	21.6
Per car per day	204	427	387	419	396	296	622	353	366	460	442	384
Gross freight earnings	$5,989,778	$49,520,190	$14,559,345	$12,763,742	$12,622,580	$31,007,392	$3,212,020	$10,167,317	$2,741,136	$14,887,919	$2,630,370	$160,101,789
Average daily earnings: Per car owned	$2.52	$2.40	$2.13	2.43	$2.34	$2.60	$6.17	$2.42	$3.90	$4.08	$2.21	$2.55
Per railroad-owned car on line	2.42	2.58	2.20	2.63	2.62	2.11	5.00	2.41	2.94	4.08	2.50	2.54
All cars on line	2.33	2.43	2.10	2.56	2.51	2.04	4.69	2.28	2.75	3.90	2.37	2.43

cally the performance and earnings of freight cars in 1907, 1908, 1909 and 1910.

Summary of July Crop Report.

The general average condition of crop growth in the United States on July 1, 1910, was about 5.5 per cent. lower than on July 1, 1909; 3.8 per cent. lower than July 1, 1908, and 3.4 per cent. lower than the 10-year average condition on July 1. In the New England states conditions are 3.5 per cent. better than a year ago and 4.1 per cent. above the average. In the Southern States conditions are about 3.5 per cent. better than on July 1 a year ago, and 2.4 above the 10-year average; in the North Central states, east of the Mississippi river, conditions are 8.7 per cent. below a year ago and 4 per cent. below the average; in the North Central states west of the Mississippi river, 15 per cent. lower than a year ago and 12.2 per cent. below the average; in the far Western states, 3.6 per cent. below a year ago and 4.3 per cent. below the average.

The following tabulation is a summary for the United States of crop conditions on July 1, with comparisons, as estimated by the United States department of agriculture.

Crops.	Condition July 1				June 1,
	1910.	1909.	1908.	10-year av.	1910.
Corn	85.4	89.3	82.8	85.1	....
Winter wheat	81.5	82.4	80.6	81.3	80.0
Spring wheat	61.6	92.7	89.4	87.1	92.8
All wheat	73.5	86.5	83.9	84.0	85.2
Oats	82.2	88.3	85.7	86.6	91.0
Barley	73.7	90.2	86.2	88.1	89.6
Rye	87.5	91.4	91.2	90.4	90.6
Flaxseed	65.0	95.1	92.5	91.1	....
Rice	86.3	90.7	92.9	89.4	....
Tobacco	85.3	89.8	86.6	86.3	....
Hay (all)	80.2	87.8	92.6	....	86.1
" timothy	79.2	87.1	90.2	85.4	....
" clover	82.8	83.8	95.5	84.6	86.6
" alfalfa	84.5	91.4	86.1	*89.4	93.1
" millet	75.2	90.0	87.8	*88.0	....
Kafir corn	82.7	89.4	85.3	*87.4	....
Pastures	81.6	93.1	94.6	91.9	88.5
Potatoes	86.3	93.0	89.6	90.9	....
Sweet potatoes	87.4	89.7	89.8	89.5	....
Apples	49.6	54.6	57.6	61.9	53.0
Peaches	62.1	50.0	69.7	61.4	62.0
Pears	61.0	57.5	69.7	....	63.2
Grapes	80.2	90.2	87.9	88.5	....
Blackberries	77.0	88.8	90.5	*90.0	80.0
Raspberries	76.2	89.5	88.4	*88.6	79.2
Watermelons	78.5	80.6	81.4	*81.4	77.4
Cantaloupes	77.8	82.4	82.7	*80.3	77.8
Oranges	82.6	86.1	91.4	*88.6	....
Lemons	88.6	88.0	92.9	*91.4	....
Tomatoes	86.1	91.6	89.4	*88.0	....
Cabbages	88.6	90.7	88.3	*89.4	88.5
Onions	89.8	91.7	90.3	*90.6	91.1
Beans (dry)	88.4	89.1	90.0	*89.6	....
Beans (lima)	87.7	89.1	90.6	....	86.3
Peanuts	87.1	86.7	88.2	*86.9	....
Broom corn	83.9	86.8	79.8	*84.7	....
Hemp	86.7	94.0	80.4	*87.1	85.6
Hops	89.6	79.2	83.8	*86.6	....
Sorghum	85.3	87.0	87.7	88.6	....
Sugar cane	87.0	92.5	91.7	90.0	84.7
Sugar beets	89.3	90.4	86.9	88.0	90.5
Cotton	80.7	74.6	81.2	79.5	82.0

*Four year averages.

The acreage of the cultivated crops, so far estimated by the Bureau of Statistics, is about 4.2 per cent. greater than last year.

The preliminary estimates of acreage in 1910 and the final estimates for 1909, for important crops, are as follows:

Crop.	1910.	1909.
Corn	114,083,000	108,771,000
Winter wheat	29,044,000	28,330,000
Spring wheat	19,742,000	18,393,000
Oats	34,380,000	33,204,000
Barley	7,057,000	7,011,000
Potatoes	3,521,000	3,525,000
Flax	3,103,000	2,742,000
Rice	717,000	720,000
Tobacco	1,216,000	1,180,000
Cotton (planted)	33,196,000	32,292,000

Reductions in Sleeping Car Rates Postponed.

The United States circuit court at Chicago issued an order on July 8 postponing the date on which the Interstate Commerce Commission's orders for reductions in sleeping car rates in the West are to go into effect, until the commission can rehear the case. The Chicago, Milwaukee & St. Paul, the Atchison, Topeka & Santa Fe, the Great Northern and the Northern Pacific were required to give bonds of $50,000 each and the Pullman Company to give a bond of $100,000 to refund to travelers after July 12 the difference between the present rates for berths and those finally fixed, in case a reduction is finally

upheld by the courts. Within 20 days after the expiration of each month the roads must also turn over to the clerk of the circuit court the difference between their earnings on the present rates and what their earnings would be on the rates prescribed by the commission. The roads must also give each passenger a coupon stating the amount which he can recover by applying to the clerk of the United States circuit court in case the commission's order finally is upheld.

The court's order was issued after it had heard arguments by counsel for the roads mentioned, and the Pullman Company on a rehearing of a petition previously filed with the court and rejected by it, for an injunction restraining the commission from enforcing its order reducing the rates. Gardiner Lathrop, general solicitor of the Santa Fe, presented figures to show that when the cost of operation is apportioned between all cars his company loses an average of $85,000 annually on its California Limited. The Santa Fe has an arrangement with the Pullman Company by which they divide the earnings and expenses of operating sleeping cars. The St. Paul operates its own sleeping cars, and William Ellis, its commerce counsel, filed a statement indicating that it loses $500,000 a year on its sleeping car business. G. S. Fernald, of the Pullman Company, told the court that application of the rates prescribed by the commission would reduce the profit on its business between the St. Paul and Fargo, S. Dak., to 1.77 per cent. on the investment. The opinion of the court was written by Judge Seaman. The reasons for the court's decision are summarized as follows:

"Many interstate rates would be lowered and become permanent rates by operation of state laws provided the commission's interstate rates were put into force.

"A new element was introduced into the case by evidence tending to show that it cost the railways much more to haul a Pullman sleeper than it did to haul a day coach, and therefore the new rates might be confiscatory and effect a discrimination in favor of passengers in day coaches.

"The commission sought wrongfully to punish the railways for their failure to appear before the commission and defend the attack made upon Pullman berth rates, but the punishment was too drastic inasmuch as the operation of the new rates eventually might prove to be confiscatory.

"The commission intimated in its decision that it had taken judicial notice of facts not introduced nor appearing on the records of the case and in so doing substantially had denied the defendants a 'full hearing' provided for by the law.

"No tenable view was presented to show that a trial of the new rates for the period prescribed by the commission would serve as a reliable test of the assumed ultimate benefits or losses thereunder."

Judge Grosscup gave an oral opinion, supplementing the written opinion of Judge Seaman. Both judges criticized both the commission and the railways. The railways were criticized for not having introduced their evidence at the original hearing before the commission. The commission was criticized on the ground that although it evidently thought the new evidence that the roads proposed to introduce essential to a proper adjudication of the case, it refused, as a vindication of its authority and a punishment to the railways for their indifference, to stay the rates prescribed pending a rehearing. Counsel for the railways explained that they had not thought it necessary to introduce all their evidence at the hearing before the commission because they did not believe that those seeking a reduction of sleeping car rates had made a case.

INTERSTATE COMMERCE COMMISSION.

Rates on Arizona Lumber Reduced.

Saginaw & Manistee Lumber Co. et al. v. Atchison, Topeka & Santa Fe et al. Opinion by Commissioner Prouty.

Present rates on lumber in carloads from Williams, Ariz., Flagstaff and Cliffs to Phoenix are unreasonable to the extent that they exceed 18 cents per 100 lbs. Present joint through rates on lumber from Williams, Flagstaff and Cliffs to points upon the Phoenix & Eastern are also unreasonable to the extent that they exceed the rates named in the report.

The complainants say that the defendants are guilty of undue discrimination in their lumber rates to Phoenix and points upon the Phoenix & Eastern because the rates from San Pedro are in many instances lower than those from Williams; but the same railway does not transport lumber from both Williams and San Pedro. It has already been decided that rates from Williams to points on this line are unreasonable, and the commission cannot assume that the Southern Pacific will so reduce its rates from San Pedro as to willfully defeat what has been found just.

The common lumber produced at Williams must be sold in southern Arizona if complainants' lumbering operations are to be successfully continued, for it will not bear the cost of transportation by rail to distant markets, and the proportion of common lumber to the higher grades is so great that the manufacture cannot be successfully conducted unless the poorer grades can be disposed of in some market at a fair price.

Through rates for the transportation of lumber and timber from Williams, Flagstaff and Cliffs to certain points in Arizona over various of defendant lines established and joint through rates prescribed for the future. (19 I. C. C., 119.)

Running of Law of Limitations.

Homer P. Fisk & Sons v. Boston & Maine. Opinion by Commissioner Clements.

While an informal letter is sufficient to stop the statute of limitations on reparation claims, yet such letter must contain all the elements of a claim. The letter relied on herein is not such a definite and independent claim as to defeat the plea of limitation. A carrier may demand its legal charges before delivering freight, and demurrage accruing during a controversy as to such payment cannot be refunded on that ground alone, but it must be shown that the charges are unreasonable or unjustly discriminatory.

Dissimilarity of conditions affecting the transportation of coal existing at Springfield. Mass., but not present at Holyoke, Mass., under the decisions of the United States supreme court negatives the presumption of unreasonableness of rates as to Holyoke shipments.

In the absence of satisfactory evidence the rate charged complainants on coal from the Lackawanna road not found unreasonable.

Refund of straight overcharge on certain shipments of coal ordered to be made. (19 I. C. C., 299.)

Method of Constructing Rates in the South Attacked.

Corporation Commission of the State of North Carolina et al. v. Norfolk & Western. Opinion by Commissioner Clements.

Because of conditions which exist at the Virginia cities and do not exist at Winston-Salem and Durham, N. C., complainant's charge of unjust discrimination is not sustained. But because defendants have constructed a system of rates on a zone or blanket system is not sufficient to justify the collection of unreasonable charges to any point. Every city is entitled to the advantage of its location and may not lawfully be subjected to high freight charges merely because railways, for reasons of convenience or otherwise, include it in a number of other points in surrounding territory, which latter points are not similarly situated.

It does not follow as a necessary consequence that the reduction of rates to Winston-Salem and Durham to a reasonable basis would necessarily entail a reduction of rates to other points in North Carolina. It might be true that certain reductions would necessarily be made, but it would be to a few points only and to a very limited extent. While it is true that transportation conditions are to some extent different on the lines extending south from Roanoke and Lynchburg than obtain on the main line from Roanoke to Norfolk, yet the difference by no means warrants rates to Winston-Salem and Durham on through traffic that are so much higher than are maintained to mainline points.

Present class rates of the Norfolk & Western on shipments from Roanoke and Lynchburg to Winston-Salem and Durham, respectively, are found unjust to the extent that they exceed the rates prescribed in the report. Present class rates of the Norfolk & Western on shipments from Cincinnati, Ohio, to Winston-Salem and Durham, respectively, are also found unreasonable to the extent that they exceed the rates prescribed in the report.

For the present no order will be made as to the traffic moving from the other western points of origin north of the Ohio named herein. (19 I. C. C., 303.)

REVENUES AND EXPENSES OF RAILWAYS.

MONTH OF MAY, 1910.
(See also issue of July 8.)

Name of road.	Mileage operated; end of period.	Operating revenues: Freight.	Passenger.	Total, inc. misc.	Operating expenses: Maintenance: Way and structures.	Maintenance: Of equipment.	Traffic.	Transportation.	General.	Total.	Net operating revenues (or deficit).	Outside operations, net.	Taxes.	Operating income (or loss).	Increase (or dec.) comp. with last year.
Baltimore & Ohio	4,198*	$5,958,328	$1,243,235	$7,629,508	$1,114,054	$1,453,541	$174,016	$2,632,007	$146,797	$5,520,415	$2,109,093	—$56,768	$187,911	$1,864,414	$280,337
Boston & Maine	2,243	2,119,623	1,213,648	3,610,824	426,584	470,994	55,320	1,520,337	84,861	2,558,096	1,052,728	425	165,490	887,663	—88,866
Central of New Jersey	668	1,601,144	390,771	2,094,256	222,892	337,692	25,091	549,480	39,032	1,174,187	920,069	2,289	96,907	825,451	272,029
Chicago & Alton	998	521,192	327,017	939,563	96,526	101,265	39,575	417,199	32,482	687,047	252,516	—553	49,000	202,963	—195,568
Chicago & Eastern Illinois	965	581,789	157,317	779,300	83,449	100,129	26,398	312,193	34,867	557,036	222,264	—883	29,900	191,481	—51,500
Chicago, Burlington & Quincy	9,040	4,435,285	1,768,309	6,817,653	1,583,684	1,249,521	134,108	2,414,781	187,895	5,569,989	1,247,664	—385	215,571	1,031,708	222,365
Chicago, Indianapolis & Louisville	616	358,868	126,036	525,815	62,573	71,950	14,680	164,071	13,645	326,919	198,896	.....	25,200	173,696	45,373
Chicago, Milwaukee & Puget Sound	1,466†	1,263,333	116,336	1,397,411	43,624	116,623	48,979	428,756	10,986	648,968	748,443	4,156	22,560	730,039	.....
Chicago, Milwaukee & St. Paul	7,511	3,547,970	1,290,627	5,304,850	843,903	672,982	65,671	2,224,366	80,985	3,887,907	1,416,943	7,478	216,041	1,208,380	166,723
Cleveland, Cincinnati, Chicago & St. L.	1,982	1,480,685	629,601	2,321,094	366,746	391,099	82,888	1,070,696	50,331	1,961,760	359,334	—9,094	80,000	270,240	—221,920
Denver & Rio Grande	2,553	1,427,716	412,408	1,922,197	226,376	296,497	48,428	609,415	49,007	1,229,723	692,474	—2,888	67,700	621,886	225,862
Galveston, Harrisburg & San Antonio	1,338	604,565	220,506	870,692	151,858	115,799	25,204	343,157	29,495	665,513	205,179	—3,192	29,166	172,821	25,234
Illinois Central	4,550	3,046,413	988,599	4,625,925	688,546	1,220,237	96,058	1,634,522	97,587	3,736,950	888,975	—4,703	201,203	683,069	—503,264
Iowa Central	558	194,451	45,266	253,324	49,029	41,741	7,064	113,433	8,148	219,415	33,909	.....	9,776	24,133	24,357
Lake Erie & Western	886	327,828	65,552	415,140	91,804	91,044	12,522	168,498	10,879	374,747	40,393	.....	18,789	21,604	—8,083
Lake Shore & Michigan Southern	1,663‡	2,730,535	841,672	4,037,468	705,563	730,826	83,244	1,411,228	64,129	2,994,990	1,042,478	—2,073	135,000	905,405	—202,803
Michigan Central	1,746	1,542,142	568,688	2,354,760	345,425	308,768	77,238	930,785	45,379	1,707,595	647,165	—1,171	113,000	532,994	—8,794
Minneapolis & St. Louis	1,027	266,081	95,785	388,322	50,931	48,008	10,302	178,415	12,012	299,668	88,654	—18	19,600	69,036	46,574
Mobile & Ohio	1,114	675,317	109,223	927,727	102,186	164,877	31,907	330,743	34,299	664,012	263,715	—2,555	25,196	235,963	53,528
Nashville, Chattanooga & St. Louis	1,230	730,901	212,057	1,006,507	157,199	166,617	36,859	340,810	22,791	724,276	282,231	—383	21,971	259,877	82,442
New York Central & Hudson River	3,588	4,832,284	2,546,284	8,249,834	1,191,109	1,330,726	177,727	3,084,768	205,927	5,990,252	2,259,582	—21,474	427,088	1,811,020	—19,133
New York, Chicago & St. Louis	558	725,555	139,727	898,878	112,021	95,629	54,450	338,710	15,498	616,309	282,569	—2,386	27,000	253,183	17,126
Oregon Short Line	1,509§	1,247,905	435,023	1,802,842	228,540	177,840	23,057	377,838	39,164	846,440	956,402	—1,680	61,962	892,760	149,277
Pittsburgh & Lake Erie	191	1,356,901	133,080	1,525,159	188,974	123,449	14,526	335,148	21,898	683,996	841,163	—721	27,200	813,242	222,684
Rutland	468	183,931	77,757	294,952	57,810	52,825	5,487	99,582	6,201	221,905	73,047	.....	10,373	62,674	11,698
St. Louis & San Francisco	4,726	2,011,802	789,777	3,025,458	396,341	429,352	68,407	1,122,347	81,032	2,097,479	927,979	.....	122,458	805,521	—187,120
St. Louis Southwestern	773	425,581	96,374	550,760	81,769	73,511	24,230	149,264	20,578	349,352	201,408	—279	27,881	173,247	—36,151
St. Louis Southwestern of Texas	703	177,826	62,370	260,788	150,908	60,948	10,587	127,373	14,537	364,354	—103,566	—285	8,333	—112,184	—92,220
Seaboard Air Line	3,013‖	1,168,328	339,505	1,691,413	227,998	234,231	54,883	543,720	50,522	1,111,354	580,059	—2,575	67,765	509,719	93,917
Southern Ry	7,050	3,074,443	1,192,067	4,659,992	552,212	813,743	125,653	1,588,648	148,347	3,228,603	1,431,389	6,619	162,093	1,275,915	189,150
Texas & Pacific	1,885	802,521	320,453	1,188,363	143,267	260,074	20,797	592,479	35,470	1,052,087	136,276	—1,056	45,217	90,003	—26,222
Texas & New Orleans	458	205,899	80,706	304,082	47,757	46,813	6,566	113,528	9,058	223,722	80,360	2,600	12,182	70,778	36,072
Toledo, St. Louis & Western	451	266,258	33,854	321,033	23,209	30,563	7,907	107,287	9,408	178,374	142,659	.....	13,900	128,759	17,913
Union Pacific	3,411¶	2,955,681	884,764	4,262,542	596,506	446,153	102,219	1,028,337	90,386	2,263,601	1,998,941	—8,063	144,512	1,846,366	63,032
Wabash	2,515	1,583,528	577,056	2,289,951	372,988	399,987	79,665	938,234	80,669	1,871,538	418,413	—3,547	75,538	339,328	—1,657
Yazoo & Mississippi Valley	1,372	596,270	174,761	816,228	177,585	155,701	16,151	275,669	22,176	647,282	168,946	920	34,930	134,936	68,156
ELEVEN MONTHS OF FISCAL YEAR, 1910.															
Baltimore & Ohio	4,198*	62,021,189	$12,820,631	$79,143,354	$10,159,714	$14,837,450	$1,671,521	$26,422,805	$1,478,472	$54,569,962	$24,573,392	—$564,680	$2,164,875	$21,843,837	$2,731,111
Boston & Maine	2,243	23,390,018	13,381,652	39,692,973	4,655,401	4,944,389	477,836	17,267,435	911,602	28,256,663	11,436,310	53,808	1,911,391	9,578,728	716,114
Central of New Jersey	668	16,525,024	4,083,610	21,764,312	1,890,360	3,500,274	309,611	5,874,025	441,905	12,016,175	9,748,137	176,204	1,077,076	8,847,265	1,040,204
Chicago & Alton	998	7,486,265	3,789,689	12,259,658	1,391,562	1,411,327	432,518	4,389,110	341,987	7,966,504	4,293,154	—16,960	420,000	3,856,194	—514,442
Chicago & Eastern Illinois	965	8,553,063	1,703,855	10,809,617	1,055,375	1,927,962	250,405	3,785,884	356,876	7,376,502	3,433,115	—14,069	332,224	3,086,822	359,577
Chicago, Burlington & Quincy	9,040	53,730,365	20,402,692	80,769,043	14,153,594	14,099,127	1,509,418	25,823,020	2,051,261	57,636,420	23,132,623	—156,820	2,371,406	20,604,397	280,901
Chicago, Indianapolis & Louisville	616	3,714,008	1,325,966	5,498,090	724,475	746,517	157,223	1,786,938	164,381	3,579,534	1,918,556	.....	243,500	1,675,056	473,397
Chicago, Milwaukee & Puget Sound	1,466†	8,555,163	874,070	9,594,112	421,810	735,732	262,486	3,095,457	112,512	4,627,997	4,966,115	32,725	212,801	4,786,049	.....
Chicago, Milwaukee & St. Paul	7,511	41,346,824	13,245,699	59,279,555	7,894,378	7,090,013	1,070,348	24,213,436	1,038,441	41,306,617	17,972,938	179,474	2,313,332	15,839,080	—1,636,470
Cleveland, Cincinnati, Chicago & St. L.	1,982	17,791,432	6,776,868	26,932,392	3,103,711	4,458,091	874,968	10,325,196	542,044	19,304,010	7,628,383	—77,743	810,328	6,740,312	1,401,443
Denver & Rio Grande	2,553	15,829,803	4,834,975	21,560,651	2,463,352	3,507,555	463,846	7,631,541	508,343	14,574,637	6,986,014	19,221	750,700	6,254,535	1,089,585
Galveston, Harrisburg & San Antonio	1,338	6,847,953	2,399,471	9,735,049	1,405,014	1,362,840	279,122	3,645,245	301,270	6,993,491	2,741,558	—25,120	325,737	2,390,701	—6,542
Illinois Central	4,550	35,827,842	10,871,931	53,271,640	6,997,687	12,439,610	1,146,458	18,075,123	1,070,898	39,729,776	13,541,864	—39,525	2,352,035	11,150,304	—516,304
Iowa Central	558	2,461,076	499,140	3,094,847	399,338	486,213	92,565	1,312,776	98,178	2,389,070	705,777	.....	88,716	617,061	178,674
Lake Erie & Western	886	4,000,325	767,357	5,024,577	715,946	902,849	141,276	1,791,269	115,984	3,667,324	1,357,253	.....	202,235	1,155,018	578,710
Lake Shore & Michigan Southern	1,663‡	29,688,751	9,742,237	44,385,223	5,529,086	6,712,469	1,034,174	14,476,767	721,593	28,474,089	15,911,134	—59,800	1,383,905	14,467,430	1,937,123
Michigan Central	1,746	17,592,253	6,312,350	26,419,578	3,311,330	3,432,369	752,151	9,873,147	461,870	17,830,867	8,588,711	—39,751	1,106,532	7,442,428	1,377,175
Minneapolis & St. Louis	1,027	3,119,434	1,098,498	4,514,865	488,861	532,708	135,897	1,815,788	145,207	3,117,961	1,396,904	—628	209,304	1,186,972	157,976
Mobile & Ohio	1,114	7,106,672	1,227,598	9,714,109	1,148,694	1,751,436	336,982	3,198,551	358,935	6,794,598	2,919,511	—28,803	250,124	2,640,584	—4,109
Nashville, Chattanooga & St. Louis	1,230	7,599,919	2,352,416	10,610,954	1,609,452	1,763,081	393,947	3,656,838	252,706	7,676,024	2,984,930	—9,108	231,384	2,694,438	374,973
New York Central & Hudson River	3,588	52,273,365	26,923,152	88,315,598	11,635,357	14,777,092	2,218,811	32,411,806	2,054,876	63,097,942	25,217,656	8,557	4,148,287	21,177,926	2,231,878
New York, Chicago & St. Louis	558	8,352,320	1,343,922	10,035,315	832,434	1,101,159	522,724	3,776,242	156,389	6,388,948	3,646,367	—17,258	333,109	3,295,999	935,360
Oregon Short Line	1,509§	13,206,308	4,729,584	19,086,459	2,019,476	1,807,357	287,337	4,174,242	357,429	8,645,841	10,440,618	—5,635	715,182	9,719,800	770,460
Pittsburgh & Lake Erie	191	13,972,765	1,364,407	15,733,289	1,572,041	1,257,712	155,575	3,460,908	231,234	6,677,467	9,055,822	—4,573	236,236	8,815,013	3,545,067
Rutland	468	1,630,471	981,520	2,929,150	423,536	420,205	69,256	1,070,956	63,414	2,047,367	881,783	.....	107,567	774,216	140,137
St. Louis & San Francisco	4,726	24,318,735	9,209,861	36,111,638	5,133,727	5,208,840	882,231	12,564,053	1,042,643	24,831,494	11,280,144	.....	1,299,010	9,981,134	112,417
St. Louis Southwestern	773	5,263,658	1,215,659	6,768,183	952,582	978,677	275,935	1,523,327	240,786	3,971,307	2,796,876	—9,079	238,326	2,549,471	364,168
St. Louis Southwestern of Texas	703	2,330,621	781,609	3,351,416	1,002,231	741,993	105,988	1,461,743	171,618	3,483,573	—132,157	—2,394	96,935	—231,486	—100,365
Seaboard Air Line	3,013‖	12,756,328	3,944,115	18,474,099	2,507,526	2,509,516	633,852	5,831,402	549,878	12,032,174	6,441,925	—24,222	680,640	5,737,062	1,376,346
Southern Ry	7,050	35,227,596	13,417,341	52,768,954	6,177,850	9,049,388	1,294,599	17,409,184	1,590,037	35,521,058	17,247,896	24,666	1,820,374	15,452,188	1,766,451
Texas & Pacific	1,885	10,021,516	3,632,913	14,612,878	1,715,963	2,333,870	226,982	5,771,442	378,265	10,426,522	4,186,356	—28,768	518,865	3,638,723	394,482
Texas & New Orleans	458	2,356,101	904,755	3,466,477	536,954	538,869	75,156	1,299,306	98,706	2,548,991	917,486	14,504	139,288	792,702	235,360
Toledo, St. Louis & Western	451	2,842,558	409,613	3,466,329	383,764	495,370	82,625	1,134,939	97,021	2,193,719	1,272,610	.....	139,600	1,133,010	82,074
Union Pacific	3,411¶	34,215,805	9,950,826	48,324,900	5,250,060	5,237,516	1,205,781	11,828,972	1,084,407	24,606,736	23,718,164	—56,814	1,630,158	22,031,192	1,376,225
Wabash	2,515	17,973,420	6,423,806	26,428,713	3,270,466	3,747,661	845,455	10,084,215	754,664	18,702,461	7,726,252	—27,731	775,786	6,922,735	1,289,453
Yazoo & Mississippi Valley	1,372	6,568,720	2,052,291	9,226,954	1,900,061	1,691,734	181,210	3,034,607	258,382	7,065,994	2,160,960	26,171	391,090	1,796,041	463,815

*Mileage operated on May 31, 1909, 3,992 miles. †Began operations on August 1, 1909. ‡Mileage operated on May 31, 1909, 1,511 miles. §Mileage operated on May 31, 1909, 1,456 miles. ‖Mileage operated on May 31, 1909, 2,987 miles. ¶Mileage operated on May 31, 1909, 3,310 miles. —Indicates Deficits, Losses and Decreases.

Indirect Case of Through Rate Being Higher Than Combination of Locals.

Lull Carriage Co. v. Chicago, Kalamazoo & Saginaw Railway et al. Opinion by Commissioner Clements.

The mere fact that a minimum applicable to parts of a combination of rates may be higher or lower than the minimum applicable to the joint through rate does not overcome the presumption of unreasonableness in a joint rate and minimum in excess of the sum of the locals and resulting from the respective minima applicable thereto. Were the commission to hold otherwise railways, by simply making differing minima on local and through shipments, could carry all through traffic via gateways they might select on higher charges than would result from combinations of locals through the same gateways. Under the circumstances here shown to exist complainant was subjected to an unreasonable charge on its shipment of wooden buggy bodies in the white from Moline, Ill., to Kalamazoo, Mich., and is entitled to reparation. Complainant's shipment of cutters from Kalamazoo, Mich., via Chicago, to Fond du Lac, Wis., does not present a combination of locals lower than the through rate on which the presumption obtains that the through rate was unreasonable, and reparation as to this feature denied.

STATE COMMISSIONS.

The Washington Railway Commission has ordered general reductions in the switching rates of the Northern Pacific at Tacoma. The reductions amount to from 31 to 60 per cent.

The Public Service Commission of New York, Second district, has appointed James J. Gill assistant supervisor of equipment, at a salary of $2,400 a year. Mr. Gill hitherto has been road foreman of engines on the New York Central & Hudson River.

The thousands of new rates filed by the railways of Indiana, to become effective August 1, have staggered the commissioners, and they are asking the roads to postpone until a later date the taking effect of the new rates. A casual examination of the tariffs shows that a month or more will be required to study them.

The convention of state commissioners, which met in Indianapolis last week, sent a petition to the Interstate Commerce Commission asking it to suspend all of the new and increased freight rates which have been filed by the railways in the Central Freight Association. The petition was signed by representatives of Indiana, Ohio and Michigan, one from each state. The secretary of the Illinois commission, who was present, said that he had no authority to sign the petition.

The Missouri railway commission on July 6 gave the railways of that state until October 15 to analyze a schedule of freight rates which the commission wants to put into effect. The proposed schedule would reduce present rates on most commodities about 8 per cent., but would increase the rates on corn, oats and wheat from 8 to 12 per cent. above what the railways are now charging. The state commission is at present under an injunction from the federal court restraining it from making reductions in rates until litigation involving rates previously made by it, which is now pending before the courts, is settled.

COURT NEWS.

The supreme court of West Virginia on July 11 refused to disturb the decision of the lower court, upholding the 2-cent fare law of that state as applied to the Chesapeake & Ohio.

Justice Mills, of the supreme court of New York, on the application of the New York Central, has issued injunctions against about 50 persons at places on the Hudson and Harlem divisions, forbidding them to speculate in commutation tickets. The defendants, keepers of drug stores, cigar stores and saloons bought non-transferable season and family tickets and allowed them to be used indiscriminately by persons who would pay them a profit on the cost of the rides.

Railway Officers.

ELECTIONS AND APPOINTMENTS.

Executive, Financial and Legal Officers.

F. M. Dudley has been appointed a general attorney of the Chicago, Milwaukee & Puget Sound, with office at Seattle, Wash.

H. J. Holden, assistant auditor of the New York, Chicago & St. Louis at Cleveland, Ohio, has been appointed auditor, with office at Cleveland, succeeding H. V. Fountain, resigned on account of ill health.

W. K. Vanderbilt, Jr., has been appointed assistant to the president of the New York Central & Hudson River and to a similar position on the Cleveland, Cincinnati, Chicago & St. Louis. He will be appointed also to similar positions on the affiliated lines.

Operating Officers.

A. N. Lyon, superintendent of the Kanawha & Michigan at Charleston, W. Va., has been appointed general superintendent.

J. G. Code and C. W. Coe, superintendents of the Wheeling & Lake Erie, have had their headquarters changed from Canton, Ohio, to Brewster.

R. G. Carden, trainmaster of the Missouri Pacific at Atchison, Kan., has been transferred to Jefferson City, Mo. W. H. Broughton succeeds Mr. Carden.

R. L. Ruby has been appointed assistant superintendent of transportation of the Southern Pacific, in charge of claim bureau, with office at San Francisco, Cal.

N. A. Williams, assistant superintendent of the Green River division of the Denver & Rio Grande at Helper, Utah, has been appointed superintendent, with office at Helper, succeeding E. B. Mitchell, resigned.

C. H. Gaunt, assistant general manager and superintendent of telegraph of the Atchison, Topeka & Santa Fe at Topeka, Kan., has resigned to become connected with the Western Union Telegraph Company. L. M. Jones, assistant superintendent of telegraph at Topeka, succeeds Mr. Gaunt as superintendent of telegraph.

Thomas F. Rowlands, whose appointment as superintendent of the Southern Pacific Company, with office at Ogden, Utah, has been announced in these columns, was born August 31, 1861, in New York. He received a high school education at Mankato, Minn., and began railway work in 1878 as an operator with the Chicago, St. Paul, Minneapolis & Omaha. For seven years from 1881 he was with the Oregon Short Line as agent and operator. He then went to the Southern Pacific and has been consecutively, until his recent promotion, operator, clerk, despatcher, chief despatcher, trainmaster and assistant superintendent.

Traffic Officers.

T. J. Williamson has been appointed a contracting agent of the Erie Despatch, with office at Indianapolis, Ind.

L. A. De Cou has been appointed agent of the Traders Despatch, with office at Seattle, Wash., succeeding W. A. Adams, deceased.

W. B. Terhune, commercial agent of the Atlanta & West Point, at Cincinnati, Ohio, has been transferred to New Orleans, La.

W. M. Anderson has been appointed a traveling freight and passenger agent of the San Pedro, Los Angeles & Salt Lake, with office at Denver, Colo.

W. J. Nolan, commercial agent of the Atchison, Topeka & Santa Fe at New Orleans, La., has been appointed general agent, with office at New Orleans, succeeding J. C. Sartelle, transferred to St. Louis.

J. C. McDonald, general passenger agent of the National Railways of Mexico at the City of Mexico, has resigned to become assistant to the general manager of the Waters-Pierce Oil Company for Mexico.

Norton England, commercial agent of the Missouri Pacific-Iron Mountain system at Atlanta, Ga., has been appointed commercial freight agent, with office at Greensboro, N. C., succeeding J. D. Dowling, resigned. S. B. Patterson succeeds Mr. England.

J. W. Gauder has been appointed a traveling freight agent of the St. Louis & San Francisco, with office at Wichita, Kan., and M. A. Fulwiler has been appointed a traveling freight agent, with office at New York. E. F. Hundley has been appointed general agent at the City of Mexico.

B. H. Stephens, general agent of the Trinity & Brazos Valley at Corsicana, Tex., has been appointed a commercial agent, with office at Dallas, Tex., succeeding E. E. Peacock, resigned. H. P. Bonner, commercial agent at Galveston, has resigned to manage with Mr. Peacock the Texas Merchants Freight Bureau.

L. L. Beck has been appointed a commercial agent of the Tennessee Central, and J. G. Larkin has been appointed a soliciting freight office, both with offices at St. Louis, Mo. M. E. Newell has been appointed a commercial agent and T. F. O'Donnell has been appointed a contracting freight agent, with office in Chicago.

G. F. Herr, general agent of the Denver & Rio Grande at Los Angeles, Cal., has been appointed assistant general passenger agent of the Western Pacific, with office at San Francisco, Cal. O. P. Applegate has been appointed a traveling freight agent of the Denver & Rio Grande, with office at Detroit, Mich.

C. Klinger, contracting freight agent of the Illinois Central at Louisville, Ky., has been appointed a commercial agent, with office at Louisville, succeeding T. B. McCabe, deceased. T. J. Horan succeeds Mr. Klinger. F. H. Webber has been appointed a contracting freight agent, with office at Atlanta, Ga., succeeding H. L. Collins.

E. L. Porter, traveling freight agent of the Cleveland, Cincinnati, Chicago & St. Louis at Jacksonville, Fla., has been appointed a commercial agent, with office at Jacksonville. C. B. Oakley has been appointed a traveling agent, with office at Tampa, Fla., reporting to Mr. Porter. J. H. Meglemry, traveling freight agent at Columbus, Ohio, has been transferred to Richmond, Va., and W. L. Dewey succeeds Mr. Meglemry.

J. H. Grace, whose appointment as assistant general freight agent of the Great Northern, with office at Chicago, has been announced in these columns, began railway work in 1883 in the Philadelphia office of the Lackawanna Line, where he remained for nine years, beginning as messenger boy and rising to traveling agent. He was then appointed agent of the Great Northern Railway and the Northern Steamship Company at Philadelphia. He was made general agent at Philadelphia in January, 1903, and two months later was transferred to Chicago, where he has been general agent until his recent appointment.

Eugene Hamilton Fell, who has been appointed assistant general passenger agent of the Atlanta, Birmingham & Atlantic, at Atlanta, Ga., was born March 19, 1877, at Newnan, Ga. Mr. Fell graduated from the high school of his native town in June, 1894, and the same year began railway work as a clerk on the Atlanta & West Point. From May, 1895, to February, 1897, he was agent of the Central of Georgia, and then for a short time was yardmaster on the Western of Alabama, since which he has been consecutively, December, 1897, to June, 1907, operator, yardmaster, clerk in the passenger department, traveling passenger agent and again clerk in the passenger department of the Central of Georgia. In June, 1907, he went to the Atlanta, Birmingham & Atlantic as chief clerk in the passenger department at Atlanta, which position he held at the time of his recent appointment as assistant general passenger agent.

Engineering and Rolling Stock Officers.

J. H. Cooper has been appointed a roadmaster of the St. Louis & San Francisco, with office at Birmingham, Ala., succeeding F. W. Farrow, resigned.

Kenneth H. Hanger has been appointed chief engineer of the Chicago, Rock Island & Gulf, with office at Forth Worth, Tex., succeeding A. B. Warner, assigned to other duties.

The office of master mechanic on the Chicago, Peoria & St. Louis has been abolished and C. S. Branch has been appointed superintendent of the mechanical department, with office at Jacksonville, Ill.

James J. Gill, road foreman of engines on the New York Central & Hudson River, has resigned to become assistant supervisor of equipment for the Public Service Commission of New York, Second district.

R. P. Black, division engineer of the Kanawha & Michigan at Charleston, W. Va., has been appointed engineer maintenance of way, with office at Charleston, W. Va., and the office of division engineer has been abolished.

Fred L. Thompson, whose appointment as engineer of bridges and buildings of the Illinois Central, with office at Chicago, has been announced in these columns, was born in February, 1872, at Grandview, Ill. He graduated with the B.S. degree in civil engineering from the University of Illinois in 1896, and began railway work with the Illinois Central in June of that year. He has since been consecutively rodman on construction work, assistant engineer in charge of grade reduction and double-track work on northern and southern lines and roadmaster on the Chicago and Louisville divisions. In January, 1907, he was made assistant engineer of bridges in charge of Grand Crossing track elevation work and all outside construction work in the bridge department, from which position he has now been promoted.

Special Officers.

E. A. Abbott, advertising agent of the Chicago, Burlington & Quincy, with office at Chicago, has resigned to become connected with Poole Brothers, railway printers in Chicago.

OBITUARY.

J. P. Burnett, until a few months ago general freight agent of the Missouri Pacific, with office at St. Louis, Mo., died in St. Louis on July 7. Mr. Burnett was born near Sparta, Ill., in 1870, and began railway work in the freight department of the St. Louis, Iron Mountain & Southern. He was transferred to the Missouri Pacific in 1898 and was successively promoted until in 1905 he was made assistant general freight agent. Later he was appointed general freight agent, which position he resigned on account of ill health.

C. L. Wellington, traffic manager of the Colorado & Southern, with office at Denver, Colo., died at Denver on July 8. Mr. Wellington was born in February, 1851, at Cambridge, Mass., and began railway work in 1873 with the Michigan Central at Detroit, Mich., as a clerk in the office of the assistant general freight agent He was then consecutively clerk with the Chicago & Grand Trunk, now the Grand Trunk Western, at Chicago; clerk with the Wabash at Toledo, Ohio; assistant general freight agent of the Wabash, St. Louis & Pacific at Chicago; commissioner of the Interstate Traffic Association at Kansas City; general freight agent of the Milwaukee, Lake Shore & Western; assistant general freight agent of the Ashland division of the Chicago & North Western; general freight agent and later traffic manager of the Wisconsin Central lines. He was for three years from November, 1896, commissioner of the Western Freight Association at Chicago, and the next year was commissioner of the Colorado Railway Association at Denver. He was appointed traffic manager of the Colorado & Southern in October, 1900, which position he held until his death.

Complaint having been made in the Prussian Parliament that the management has been building too elegant houses for its employees, the minister replied that there was a time when they were rather over-doing it, but that all that had been stopped. Until a few years ago they could build a house for four families for $4,000, or a little more; now, however, such a house costs an eighth and sometimes a quarter more. For men above the lower grades a house for one family may cost about $2,100.

Railway Construction.

New Incorporations, Surveys, Etc.

Alaska Roads.—An officer of the Copper River & Northwestern is quoted as saying that the company will build an extension to the Bering river coal fields as soon as the government makes arrangements for the mining of coal. Harry White, of Los Angeles, Cal., and associates are quoted as saying that they have funds ready to build a line from Controller bay to the coal fields in that district, and the Controller Bay & Bering Coal Railway is said to be clearing right-of-way for a line to Canyon Creek.

Algoma Central & Hudson Bay.—Bids are wanted up to July 23 by R. S. McCormick, chief engineer, Sault Ste. Marie, Ont., for the construction to subgrade of a section of the Manitoulin & North Shore Railway from the north side of Goat Island Channel, Ont., near Little Currant northerly to the White Fish river, about 18 miles.

American Falls, Rockland & Southeastern.—Incorporated in Idaho to build from American Falls, Idaho, south to Rockland, 30 miles. D. W. Davies, American Falls, is the principal promoter.

Atchison, Topeka & Santa Fe.—According to press reports, extensive improvement work is now being carried out on the Eastern Railway of New Mexico in Eddy county, N. Mex. It is said that improvements are being made to the roadbed and track south to Pecos, Tex.

Canadian Northern.—According to press reports, the Northern Construction Co. has started work on a 60-mile section of the Canadian Northern Pacific from Port Mann, British Columbia, oposite New Westminster, up the valley of the Fraser river. (June 10, p. 1436.)

Canadian Northern Ontario.—An officer writes that grading has just been started on the line from Hawkesbury, Ont., east to Montreal, Que. J. P. Mullarkey, Montreal, is the contractor.

Canadian Northern Pacific.—See Canadian Northern.

Central Railroad of New Jersey.—An officer writes regarding the reports that the tunnel at Glen Onoko, Pa., is to be removed by blasting away the rock through which it is built, at a cost of about $1,000,000, that the company has this work under consideration. Arrangements have not yet been made to carry out the improvement.

Controller Bay & Bering Coal Railway.—See Alaska Roads.

Copper River & Northwestern.—See Alaska Roads.

Dakota, Kansas & Gulf.—Surveys for this line have been finished, it is said, and right-of-way is to be secured at once. The plans call for a line from Beloit, Kan., northwest to Kearney, Neb., about 120 miles. The maximum grade will be 26 ft. to the mile and maximum curvature 3 degs. The work will be heavy south of the Republican river, and it will be necessary to construct 10 steel viaducts, one of which is to be 1,500 ft. long, and another 500 ft. In addition, there will be bridges crossing the Republican and Platte rivers. W. H. Mitchell, president, Beloit.

Deering Southeastern.—An officer is quoted as saying that the company is planning to build an extension from Deering, Mo., east to Caruthersville, 13 miles, also an extension from the southern terminus at Camp southwest to Hornersville, seven miles.

Eastern Railway of New Mexico.—See Atchison, Topeka & Santa Fe.

Fort Smith, St. Louis & Chicago.—This company, which was organized last year, proposes to build from Fort Smith, Ark., northeast to Bergman, about 100 miles. It has not yet been decided when bids will be asked for the work. L. S. Powers, president, and W. A. Richardson, chief engineer, Harrison.

Garden City, Gulf & Northern.—This company was organized to build from Plains, Kan., north via Garden City and Scott to St. Francis, in Cheyenne county, about 225 miles. Track has been laid on the 40 miles from Scott south to Garden City. According to press reports, work was recently started on the section north of Scott, and it is understood that the company expects to have the 58 miles north to Oakley, which is on the Union Pacific, finished during 1910. B. M. McCue, president, and William H. Cost, chief engineer, Garden City. (April 1, p. 918.)

Gotebo & Southwestern.—Final surveys have been made, it is said, and plans are ready to begin work on a line from Gotebo, Okla., southeast to Lawton, 50 miles. The offices of the company are at 408 New York Life building, Kansas City, Mo.

Grand Trunk.—The Massachusetts Railroad Commission has granted a certificate of exigency to this company to build the section through Massachusetts of the proposed extension from Palmer southeast to Providence, R. I. Permission has already been granted in Rhode Island to build the section of the line in that state. (See N. Y., N. H. & H., June 17, p. 1568.)

Hampden Railroad.—Organized in Massachusetts, with $1,000,000 capital, to build from Springfield, Mass., northeast to Bondsville, on the Boston & Maine, with a branch north to Holyoke. The directors include R. D. Gillett, H. W. Ely and A. D. Robinson, Westfield; A. W. Eaton, Pittsfield; J. A. Skinner, Holyoke; H. H. Bowman and E. T. Ley, Springfield.

Hanford & Summit Lake (Electric).—Incorporated in California, with $500,000 capital, and office at Hanford, Cal. The company plans to build a loop line from Hanford via Grangeville and Hardwick, into the Summit lake region, thence returning through Lemoore and Armona. C. K. Hardwick, J. O. Hickman, G. C. Aydelott, Hanford; R. W. Heins, Santa Cruz, and C. McClellan, San Francisco, are directors.

Huntingdon, Lewistown & Juniata Valley Traction.—This company has given a mortgage for $4,500,000 to cover the cost of building about 50 miles of new line. Contracts were let in May to W. D. Cassone and to the Pennsylvania Excavation Co., both of Allentown, Pa., to build from Mount Union, Pa., north via Mill Creek to Cold Spring Park, 18 miles, with a line running northeast from Mill Creek to Reedsville, thence south to Lewistown, 30 miles. J. Murray Africa, chief engineer, Huntingdon. (May 20, p. 1281.)

Kansas City, Mexico & Orient.—Work is now under way by Roach & Stansell, Memphis, Tenn., on 160 miles of line between San Angelo, Tex., and Fort Stockton. The work consists of rock cuts and earth excavation. (May 13, p. 1237.)

Manitoulin & North Shore.—See Algoma Central & Hudson Bay.

Massillon & Brewster Air Line.—Preliminary surveys are said to be made for a line from Massillon, Ohio, south to Brewster, 6.5 miles. J. G. Wise, Massillon, is interested.

Memphis & St. Louis.—This company, which held an option until July 1 on the grade between Pierre, S. Dak., and Aberdeen, has been granted an extension of 90 days in which to sign a contract to bulld the line.

Memphis, Dallas & Gulf.—See Memphis, Paris & Gulf. (June 10, p. 1437.)

Memphis, Paris & Gulf.—This company has been granted permission to build an extension from the present terminus at Murfreesboro, Pike county, Ark., northeast to Memphis, Tenn., 255 miles; also to build an extension from the western terminus at Ashdown, Ark., southwest to a point on the Red river opposite Shaws, Tex., 18 miles. The line is eventually to be extended in Texas under the name of the Memphis, Dallas & Gulf, to Dallas. (April 8, p. 970.)

Midland-Pennsylvania.—According to press reports this company, which was organized early this year, is planning to begin construction work on the line from Millerburg, Pa., northeast via Gratz to Ashland, about 43 miles. W. E. Harrington, president, Philadelphia, Pa.

Missouri Pacific.—An officer writes that a contract has been given to T. B. Jones & Co. for work on five miles of second-track between Jefferson City, Mo., and Coal Junction. The work includes the reconstruction of the terminal yard at Jefferson City.

Montana, Idaho & Pacific.—Plans of the survey from

Lapwai Junction, Idaho, east to the clearwater section of Idaho and the Lolo pass have been filed. The line is eventually to be extended further east of Butte, Mont. J. H. Richards, president, Boise, Idaho, and G. W. Boschke, chief engineer, Portland, Ore.

MT. GILEAD (OHIO) TRACTION.—As soon as a report is made by the engineers, Roberts & Abbott Co., Cleveland, Ohio, financial arrangements are to be made and work started on a system of electric lines radiating from Mt. Gilead, Ohio, to connect with Mansfield, Mt. Vernon, Delaware, Marion and Galion, a total of 107 miles. The General Traction Development Co., 516 Hippodrome building, Cleveland, will have charge of the entire work of organization, financing, construction and subsequent operation of the line. E. F. Wheaton, vice-president and general manager, Cleveland. There is no truth in the newspaper reports that the company proposes to build extensions into the Indiana fields.

NEVADA-CALIFORNIA-OREGON.—An officer writes that a contract was let last month to the Hall Construction Co. for building an extension of 16 miles up Pitt river canyon to Goose lake, Cal. The line is eventually to be extended further north to Lake View, Ore. (April 1, p. 918.)

NEW ORLEANS GREAT NORTHERN.—Announcement is said to be made that this company will build about six miles of line to a point north of Jackson, Miss.

NEW YORK SUBWAYS.—The New York Public Service Commission, First district, expects to ask for bids in about two weeks to construct the triborough subways on the route proposed by the commission. (April 8, p. 974.)

NEW YORK, NEW HAVEN & HARTFORD.—The petition of this company for a certificate of public exigency to build an extension from the Southbridge branch near the terminus at Southbridge, Mass., northwest 19.3 miles to a connection with the Central Vermont at Palmer, has been refused. This route is a part of that over which the Grand Trunk proposes to build. (June 24, p. 1812.)

OREGON & WASHINGTON.—This company is said to have secured right-of-way for a line from Cosmopolis, Wash., south for seven miles to North river, thence northeast along that stream for five miles. An officer is quoted as saying that the line is not to be extended to the Willapa harbor, and that the plans only call for a belt line through timberlands in the North river country, to have a total length of about 24 miles.

SAN ANTONIO & ARANSAS PASS RAILWAY CO.—An officer writes confirming the report that new track is to be laid on sections of this road as follows: between Houston, Tex., and Yoakum; Kenedy and Skidmore, and between Yoakum and Moulton. The work is to be carried out at an early date. Orders have already been placed for rail to be used on the first 100 miles. (July 1, p. 54.)

SAN DIEGO & ARIZONA.—This company was organized to build from San Diego, Cal., east to Yuma, Ariz., on the Colorado river. A section of the line is to run through Lower California and Mexico. Work has been finished on 30 miles, and a grading contract was recently let for a section of the line in Mexico. E. J. Kallright, chief engineer, Union building, San Diego. (Dec. 24, p. 1262.)

VIDALIA & SOUTHEASTERN.—Application has been made for a charter in Georgia, it is said, to build from Vidalia, Ga., east via Reidsville to Fleming, about 60 miles. A. Y. Garbutt, Montgomery, and F. K. Durden, Vidalia, are incorporators.

WASHINGTON-VIRGINIA.—Incorporated in Virginia to build from Bluemont, Va., southeast to Vienna, 50 miles. M. E. Church, president and general manager; G. B. Fadeley, vice-president, and L. L. Northrup, treasurer, Falls Church.

WRIGHTSVILLE, ADRIAN & LYONS.—This company, which was recently organized in Georgia to build from Wrightsville, Ga., southeast to Lyons, is said to have amended its charter increasing the capital from $100,000 to $1,000,000 and providing for an additional line from Wrightsville northwest to Milledgeville through Johnson, Washington and Baldwin counties. The plans include an extension from Lyons to Brunswick. Grading work has been finished on six miles. T. J. James, president, Adrian. (April 29, p. 1115.)

Railway Financial News.

ALGOMA CENTRAL & HUDSON BAY.—The Bank of Montreal, London, recently offered at 90 £770,000 (about $3,850,000) 5 per cent. first mortgage bonds of 1910-1960 of the Algoma Central & Hudson Bay. The total authorized issue of these bonds is $6,750,000. The remaining $3,000,000 is to be issued in France. The principal and interest are unconditionally guaranteed by the Lake Superior Corporation. The company has 80 miles of road in operation.

ANTOINE VALLEY.—See Memphis, Dallas & Gulf.

CHICAGO & ALTON.—The executive committee, at a meeting held on July 12, took no action looking toward the declaration of a dividend on the common stock. It is said that the question of dividends on the common stock did not come up at the meeting, but that it might be discussed at a meeting of the executive committee next week. The Alton paid 1 per cent. dividends on its common stock August 15, 1908, and in February and August, 1909, and February, 1910, semi-annual payments of 2 per cent. were made.

KANAWHA & MICHIGAN.—Colonel C. S. Reynolds, president of the First National Bank of Toledo, has been elected a member of the board of directors of the Kanawha & Michigan.

KANSAS CITY, MEXICO & ORIENT.—Parrs Bank, Ltd., and Boulton Brothers & Co., both of London, recently offered $5,000,000 first mortgage 4 per cent. bonds of 1901-1951 at 84, the subscriber for each $1,000 bond being entitled to a certificate representing an option to buy until June 1, 1913, three fully paid preferred shares, par value $100, at $40 per share, and three fully paid common shares, par value $100, at $25 per share.

LEHIGH VALLEY RAILROAD.—The New York Public Service Commission, Second district, has authorized the Lehigh Valley Railway to issue $825,000 50-year 5 per cent. debenture bonds to the Lehigh Valley Railroad on account of advances made in 1908, 1909 and up to June 30, 1910, for improvements and betterments.

MEMPHIS, DALLAS & GULF.—A press despatch from Little Rock, Ark., says that this compay has filed a certificate of increased capital stock from $645,000 to $7,875,000. The company has issued a circular which says that on July 1 the Memphis, Dallas & Gulf took over the Atoine Valley Railroad and the Ultima, Thule, Arkadelphia & Mississippi, and these two roads will hereafter be operated as divisions of the M. D. & G.

NEW LONDON NORTHERN.—The $1,500,000 consolidated mortgage bonds, due July 1, 1910, were paid at maturity, and Kidder, Peabody & Co., Boston, and Strong, Sturgis & Co., New York, are offering a new issue of $1,500,000 first mortgage 4 per cent. bonds of 1910-1940. The road runs from New London, Conn., to Brattleboro, Vt., 121 miles, and is leased to the Central Vermont for 99 years from December 1, 1891, at a yearly rental sufficient to provide the interest on the standing bonds and 9 per cent. dividends on the capital stock.

PITTSBURGH, SHAWMUT & NORTHERN.—The receiver has been granted permission by the New York Public Service Commission, Second district, to issue $1,500,000 additional receiver's certificates. The proceeds of these certificates are to be used to reimburse the receiver for the purchase of equipment and for the payment for extensions and improvements.

ROME, WATERTOWN & OGDENSBURG.—The company has asked the New York Public Service Commission, Second district, for permission to issue $419,000 consolidated mortgage bonds, of which $417,800 are to be used to refund an equal amount of 6 per cent. bonds maturing September 1.

TEXAS CENTRAL.—A stockholders meeting has been called to vote on the question of authorizing a mortgage to secure bonds to the amount of $20,000,000. The proceeds of the sale of these bonds are to be used for improvements and extensions.

ULTIMA, THULE, ARKADELPHIA & MISSISSIPPI.—See Memphis, Dallas & Gulf.

Supply Trade Section.

H. S. White has been appointed sales manager of the Detroit Seamless Steel Tubes Co., Detroit, Mich.

Fire damaged the plant of the American Insulated Wire & Cable Co., West Twenty-first and Morgan streets, Chicago, on July 6.

H. W. Marsh has been appointed general manager of the Milwaukee Car Mfg. Co., Milwaukee, Wis., succeeding T. F. Howe, whose resignation has been announced in these columns.

The Isthmian Canal Commission will receive bids until July 19 for manganese tumblers and rollers, bushings, lag and set screws, engine indicators, steam traps, hose couplings, flanges, rubber tires, rubber valves, gage-glass gaskets, asbestos packing, rubber boots, emery cloth, etc. (Circular No. 593); and until August 8 for fixed irons for rising-stem gage valves, cylindrical valves, and snubbing hooks and girders for the canal locks (Circular No. 594).

The Westinghouse Electric & Manufacturing Co., New York, is to pay on August 1 the $6,000,000 three-year 6 per cent. collateral notes issued in 1907. Of the funds necessary to make this payment, $2,000,000 are surplus treasury funds and $4,000,000 the proceeds of the sale of a new issue of three-year 6 per cent. collateral notes due August 1, 1913. Kuhn, Loeb & Co., New York, are offering to exchange at par the new notes for the old notes due August 1, 1910.

The Lackawanna Steel Co., New York, and subsidiary companies, report earnings for the quarter ended June 30, 1910, and the six months ended June 30, which compare with those of the same period last year as follows:

	1910.	1909.	—Changes—	
†Income, mfg. & operat'n	$1,662,002	$586,863	Inc.,	$1,075,138
Proportion of earnings on investment.‡	349,000	80,460	"	268,539
Total	$2,011,002	$667,323	Inc.,	$1,343,678
Deduct interest	437,500	406,875	"	30,625
Sinking funds	101,402	90,816	"	10,585
Dep. and renewals	364,063	282,537	"	81,526
Total deduction.....	$902,965	$780,229	Inc.,	$122,736
Surplus	1,108,036	*112,905	"	1,220,941
Jan. 1 to June 30:				
†Income, mfg. & operatn..	$2,770,343	$765,583	Inc.,	$2,004,809
Proportion of earnings on investment.‡	678,000	160,920	"	517,079
Total	$3,448,343	$926,454	Inc.,	$2,521,889
Deduct interest	854,583	792,500	"	62,083
Sinking funds	191,614	141,223	"	50,391
Dep. and renewals	708,165	483,359	"	224,806
Total deduction.....	$1,754,363	1,417,082	Inc.,	$337,280
Surplus	1,693,979	*490,628	"	2,184,608

Unfilled orders (gross tons) June 30 were 379,836, against 384,984 last year.

*Deficit.
†After deducting all expenses incident thereto, including ordinary repairs and maintenance of plants and interest on bonds and fixed charges of subsidiary companies.
‡In not controlled companies.

TRADE PUBLICATIONS.

Pneumatic Hammers.—The Ingersoll-Rand Company, New York, in Form No. 8003, describes its "Imperial, Type E" pneumatic riveting hammers.

Rolled Steel Step Joint.—The Q. & C. Co., New York, has issued a pamphlet describing its Bonanza rolled steel step joint, for use in joining rails of different sections.

Electric Fans.—The Sprague Electric Company, New York, in leaflet 322-A, gives specifications and price lists of the alternating current electric fans which it manufactures.

Door Fastener and Check.—Irving S. Elliot, selling agent, Lakeport, N. H., has issued a folder describing the Laconia sliding door fastener and check for mail, baggage or express cars.

Motor Inspection Cars.—The Buda Company, Chicago, in Bulletin No. 43, describes its No. 100 Buda gasolene motor inspection car. This company also makes other styles of motor cars for section use, including motor velocipedes.

Rail Laying Machine.—The Q. & C. Co., New York, has issued a pamphlet describing its rail-laying machine, and illustrating its use for renewing rails as compared with the method of employing a large number of men with tongs.

Induction Motors.—The Sprague Electric Company, New York, has just issued Bulletin No. 600, containing general detail descriptions of the single and polyphase induction motors which it manufactures. Complete specifications and dimensions of these motors are given.

Oregon Short Line.—"Where Gush the Geysers" is the title of a large booklet issued by the Oregon Short Line advertising the all-rail route to the Yellowstone. The booklet is full of attractively colored photographs, interesting descriptive matter, instructive relief maps of the country and data concerning cost of tours through the park.

Flexible Steel Armored Hose.—The Sprague Electric Company, New York, has just issued a pamphlet describing its flexible steel armored hose, including: special air drill hose, pneumatic tool hose, water hose and steam hose. This company also makes a number of couplings for hose, which latter are also shown in the catalogue.

Telephone Power Plant Equipments.—The Western Electric Company, New York, has published its Bulletin No. 100B, describing telephone power plant equipments for non-multiple switchboards. This bulletin presents some features of Western Electric power apparatus designed especially for telephone plants. The subject matter covers only such apparatus as is required for non-multiple switchboards having capacity up to 800 lines and which have been previously described in Bulletins 1003, 1004 and 1005.

RAILWAY STRUCTURES.

BELOIT, KAN.—See Dakota, Kansas & Gulf under Railway Construction.

CAMPBELLTON, N. B.—A fire which occurred on July 11 at Campbellton is said to have burned 1,000 buildings and caused a financial loss of nearly $3,000,000. The buildings that were destroyed included the Intercolonial Railway station, roundhouse and machine shops.

CARLSBAD, N. MEX.—See Lakewood, N. Mex.

CARMI, ILL.—According to local press reports, the Louisville & Nashville has announced that it will build a new passenger station.

CONNELLSVILLE, PA.—The Western Maryland has given a contract to the McClintic-Marshall Construction Co. of New York and Pittsburgh, for about 40 steel bridges to be built on the line now under construction from Cumberland, Md., north to Connellsville, Pa.

DES MOINES, IOWA.—The contract for the West Seventh street viaduct has been let and work is to be begun as soon as possible. This structure was described in the *Railway Age Gazette* of January 15, 1909.

GARY, IND.—The union station at Gary, built jointly for the Lake Shore & Michigan Southern and the Baltimore & Ohio, has been formally opened. The station cost $250,000.

HOUSTON, TEX.—Plans have been made for the new Southern Pacific office building at Franklin and Travis streets in Houston. It is understood that construction work will be started soon. (April 22, p. 1069.)

JOLIET, ILL.—The Elgin, Joliet & Eastern has let the contract

to Cook & Lund, Chicago, for building a brick and concrete roundhouse.

LAKEWOOD, N. MEX.—According to press reports, a new bridge is being built across the Pecos river by the Eastern Railway of New Mexico, a subsidiary line of the Atchison, Topeka & Santa Fe, at a point south of Lakewood, and a steel bridge is being put in place over the Pecos river at a point north of Carlsbad. The bridges over Huckleberry draw and Dark canyon, south of Carlsbad, are also being rebuilt.

NEW YORK, N. Y.—Bids are in for building nine stations on the line of the New York, Westchester & Boston. Six of the stations are to be built in the borough of the Bronx, two in Mount Vernon and one in New Rochelle. Contracts are to be let for the work in the near future. (April 29, p. 1117.)

NORTH NORWICH, N. Y.—The New York Public Service Commission, Second district, has been petitioned by the State Highway Commission to order the elimination of a crossing in the town of North Norwich, Chenango county. This is to be accomplished by building an overhead structure for highway traffic over the tracks of the Delaware, Lackawanna & Western and the New York, Ontario & Western railways.

PALMYRA, PA.—The Philadelphia & Reading, it is said, will put up a new passenger station at Palmyra, Pa., to replace the present wooden structure.

PITTSBURGH, PA.—According to press reports, work is under way by C. A. Van Dusen, Pittsburgh, carrying out improvements to secure better connections between the tracks of the West Side Belt and the Pittsburgh & Lake Erie below the Point bridge. The work includes putting up a new steel and concrete bridge at Saw Mill run. The contract is said to be worth $200,000.

QUANAH, TEX.—The Quanah, Acme & Pacific is to begin work at once on the five-stall roundhouse mentioned in the *Railway Age Gazette* of August 6, 1909.

QUEBEC, QUE.—Bids are wanted by L. K. Jones, secretary of the Department of Railways and Canals at Ottawa, Ont., up to September 1, for the superstructure of the Quebec bridge over the St. Lawrence river near Quebec. Plans and specifications may be secured from the Quebec Bridge Board of Engineers, Canadian Express buildings, Montreal, and at the Department of Railways and Canals. (April 29, p. 1118.)

ROUND ROCK, TEX.—According to press reports, plans have been filed by the International & Great Northern for a passenger station to be built at Round Rock.

ST. LOUIS, MO.—The Illinois Traction System has let the contract to Kremer & Voirol, St. Louis, for building the express station at Twelfth and Lucas streets mentioned in the *Railway Age Gazette* of August 20, 1909. It will be a two-story structure of brick and will cost about $45,000.

WINNIPEG, MAN.—The Canadian Northern has lost a number of passenger stations, freight depots, water stations and yard materials in the bush fires of the past weeks.

FOREIGN RAILWAY NOTES.

The Norwegian minister of commerce, Arctander, has been retired because he was opposed to woman suffrage, and is succeeded by the late minister of public works, Bränne, who is himself succeeded by the engineer, Darre-Jenssen, who built the Gellivara Railway north of the Arctic circle, and also lines in Spain.

Professor Belelubsky, who has long held the chair of bridge engineering in the Russian School of Bridges and Highways (which, by the way, is a hundred years old this year), recently lectured in Berlin on Russian bridge-building, and during the lecture he said that there is a similar institution in Russia for women, in which some 600 girls are studying; and he showed a photograph of one of the graduates at her level, clothed in a natty uniform.

Late News.

The items in this column were received after the classified departments were closed.

The Railroad Commission of Texas has granted a postponement until August 1 to the railways entering Dallas to submit plans for the union passenger station. (April 29, p. 1117.)

Right-of-way has been secured and work is to be started at once, it is said, by the Oregon Short Line on the branch from Ashton, Idaho, southeast to Driggs, 40 miles. (April 15, p. 1016.)

H. B. Nichols, engineer of way of the Philadelphia Rapid Transit Co., has been appointed chief engineer, succeeding W. S. Twining, resigned. George B. Taylor, assistant engineer of way, succeeds Mr. Nichols, all with offices at Philadelphia, Pa.

The Mexican Railway, which operates a line from Mexico City, Mex., east to Vera Cruz, has adopted plans for improvements and extensions of branch lines, it is said, to cost $2,000,000. This includes putting up a bridge over the Metlac barranca. The improvements will eliminate two tunnels, reduce the grade and shorten the distance about four miles.

The Utah & Salt Lake Electric has been organized in Utah with a capital of $1,500,000 and headquarters at Provo. The company plans to build a line from Salt Lake City, Utah, south via Sandy, Lehi, American Fork, Provo and Springville to Payson, about 70 miles. S. Bamberger, S. L. Chipman, C. Hanks, W. L. Hayes, G. W. Craig and G. C. Whitmore are interested.

The Boston Chamber of Commerce has sent to Montreal James J. Storrow, former president of the chamber, and D. O. Ives, the chamber's transportation expert. Messrs. Storrow and Ives will see the principal officers of the Grand Trunk in an effort to induce them to make Boston a coast terminal as well as Providence, which, under plans already laid down, had been selected as a terminal point of the road.

It is given out informally in Washington that the Interstate Commerce Commission will not suspend the increased commutation fares between New Jersey points and New York City, as petitioned for by the attorney-general of New Jersey and a number of other parties, but will, in the near future, investigate these rates on its own motion. But it is said that in the matter of freight rates, extensive advances in which have been announced for August 1 throughout Trunk line and Central Traffic Association territory, the commission will issue a suspending order.

The Order of Railway Conductors and the Brotherhood of Railroad Trainmen have voted to strike on the Pennsylvania Railroad unless the company agrees to the 10-hour day; that is, to pay overtime on every trip that consumes more than 10 hours. This is what has been agreed to by the other roads which have recently settled with their trainmen, though on these other roads the mileage rates are not as high as on the Pennsylvania. The conductors voted 1,863 for and 448 against a strike in case the company did not accede to their demands; the trainmen voted 10,918 for and 965 against a strike. At the conference held Wednesday afternoon, at which the conductors were represented by A. B. Garretson and the trainmen by W. G. Lee, General Manager Meyers, of the Pennsylvania, stated definitely that the company could not afford to make any agreement with its men which would increase operating expenses. The company is willing to put the 10-hour day in effect on the Pennsylvania on the same basis that this day is in effect on the New York Central Lines. The employees acknowledge that the rates of pay on the Pennsylvania have been higher in the past than on other roads, and base their demand for an increase in the rate of pay on the argument that the Pennsylvania has educated its men to believe that they are worth more than employees of other roads. While General Manager Meyers was unwilling to meet any of the demands of the employees which would necessitate an increase in expenses, he took their demands under consideration, and there is to be another conference on Thursday afternoon. The vote to strike authorizes a strike only in case the committee representing the conductors and trainmen cannot come to an agreement with the company.

Equipment and Supplies.

LOCOMOTIVE BUILDING.

The Pittsburgh, Shawmut & Northern is in the market for two locomotives.

The Spokane, Portland & Seattle is in the market for three 10-wheel locomotives.

The Texas Southeastern has ordered one ten-wheel locomotive from the Baldwin Locomotive Works.

The Chino Copper Co., 71 Broadway, New York, is in the market for two 16-in. x 24-in. cylinder, four-wheel switching locomotives.

CAR BUILDING.

The Baltimore & Ohio is in the market for 1,000 gondola cars.

The Chicago & Northwestern has ordered 200 milk cars from the American Car & Foundry Co.

The Chilean State Railways have ordered four sleeping and four parlor cars from the Pullman Company.

The Michigan United Railways, Jackson, Mich., are in the market for 30 city cars, one snow sweeper and one sprinkler car.

The Northern Pacific inquiry for 1,000 all-wood refrigerator cars, reported in the *Railway Age Gazette* of May 27, is said to be assuming definite form.

The National Railways of Mexico have ordered 1,600 box, 500 gondola, 100 tank, 150 flat and 150 stock cars from the American Car & Foundry Company.

The Mexican Railways, reported in the *Railway Age Gazette* of March 11 as in the market for 10 coaches, have ordered four first class and six second class coaches from the Harlan & Hollingsworth Corporation.

MACHINERY AND TOOLS.

The Canadian Pacific is in the market for one steam shovel.

The Grand Trunk Pacific is in the market for one rotary snow plow.

IRON AND STEEL.

The Wheeling & Lake Erie has ordered 1,200 tons of rails from the Carnegie Steel Co. and 1,100 tons from the Lackawanna Steel Co.

The San Antonio & Aransas Pass has ordered 11,000 tons of O. H. rails from the Tennessee Coal, Iron & R. R. Co. for use on work mentioned in the *Railway Age Gazette* under Railway Construction, July 1.

The Western Maryland has let the contract to the McClintic-Marshall Construction Co. for all bridge and viaduct work on the 83-mile branch line from Cumberland, Ma., to Connellsville, Pa. The contract includes about 12,000 tons of structural steel.

General Conditions in Steel.—It is estimated that the various steel companies are receiving orders at the rate of about 50,000 tons per day, about 20 or 30 per cent. below actual production. These figures cover all classes of steel, mostly industrial work, as the railways, since the first of the present month, have placed few contracts for rails, bridges or equipment. Some shading of prices for some classes of steel is reported, but this cutting is not of a radical nature.

Painting of Steel Cars.

Records obtained from seven of the largest railways in the country and a number of car builders show that the perfect method for painting steel cars is yet to be found. In two instances, cars painted by the present method have failed, showing rust and disintegration inside of six months; and two railways have come to the conclusion that they know so little about forming or drawing up specifications for painting that they have left the painting of steel cars to the car builder, with certain restrictions as to colors and materials used.

One of the principal methods now in use is as follows: The steel sheets and trim in most cases are pickled with the intention of removing such mill scale as may appear, and to make as smooth a surface as possible for the first or priming coat. When the car is ready for treatment it is usually primed with a mixture of leads or zinc, combined with a certain amount of dryer and some color. This is then rubbed to a surface, and then two to three coats of a roughing material are often applied. This is also rubbed to a smooth finish and the car is ready for the body color, which is applied in one or two coats. After this is set, the varnish is applied and the car is then striped and lettered, and the last coat of finishing varnish applied.

Regarding the above and present methods for painting steel cars, it has been found that failures are due not so much to the class or grade of material used, as to the inability of the film formed by those materials to present to the elements and conditions found in service, an absolutely non-porous film; also one that is not only waterproof, but acid proof, and one that holds sufficient life or flexibility after being in service to withstand the expansion and contraction of metal and the action of the weather.

It has been found that in pickling the sheets as above, enough of the pickle or acids used has been left or retained in the pores of the sheets to start the action under the film of paint after the cars have been finished to cause the premature opening of pores in the paint film, allowing dampness to enter and reach the metal, which naturally causes rust and disintegration, the drying and flaking of the paint film.

When the paint film is applied and the cars are run in service, there is a weather action which tends to dry and harden the paint film in addition to the dryers that are used with the paints. It is not long before the weather action begins to absorb such binders, or, in other words, the life of the paint film, and it begins to show cracks and check marks, the color begins to fade, and disintegration is started.

It is found from experience and practical test that to procure and make a perfect paint film a perfect binder must first be obtained, one that embodies all the features which the present paint does not include. This material is said to have been found in Flexible Compound. This compound is not a paint or a varnish, but is a material garnet in color and has about the same body as raw linseed oil. It is pure and free from all substances that would tend to disintegrate or deteriorate when used in connection with paints. Therefore, it makes a good binder. It is also free from benzine and dryers or cheap oils of any nature.

The peculiar features of this Flexible Compound are that it is waterproof, acid proof, flexible and retains these features permanently; does not dry down with age, but bodies in drying; is non-porous, and with the above features in itself or in connection wth leads, oils and pigments, makes a paint that is both rust and waterproof.

The binder now used to hold pigments together is linseed oil, and this, due to its present method of manufacture (a process of steaming the flaxseed before pressing), causes the oil to retain a percentage of moisture. This moisture is present to a greater or less extent in all colors ground in oil. Therefore, when these colors are used this moisture contained in them is injurious, due to the fact that when the weather action takes place, particularly sun action, pores soon appear in the paint film and the binder is slowly absorbed.

When this action takes place, and is completed, the paint film has hardened down, the gloss is lost and there is nothing left but lead and pigments in a dead and cracked form. When this stage is reached it is very easily seen that rust and disintegration soon start in the metal underneath.

Flexible Compound used in connection with leads and dry colors according to formulæ will make a paint that presents a film that is impervious to acid or weather actions or to any cause that would naturally cause failures of paints mixed under the old or present formulæ.

In the use of compound it is necessary in most instances to use any form of pickle or previous treatment of sheets in steel car construction. Sand blasting is much better. Some companies have gone to the trouble and expense of sherardizing their sheets, but this fails to coat the sheets with a non-porous and impervious film that is left on the sheet by sherardizing. Therefore, sand blasting alone is all that is necessary where treating materials with this compound with leads, oils and pigments.

Flexible Compound is sold by Joseph M. Brown, dealer in railway equipment and specialties, 303 Great Northern building, Chicago.